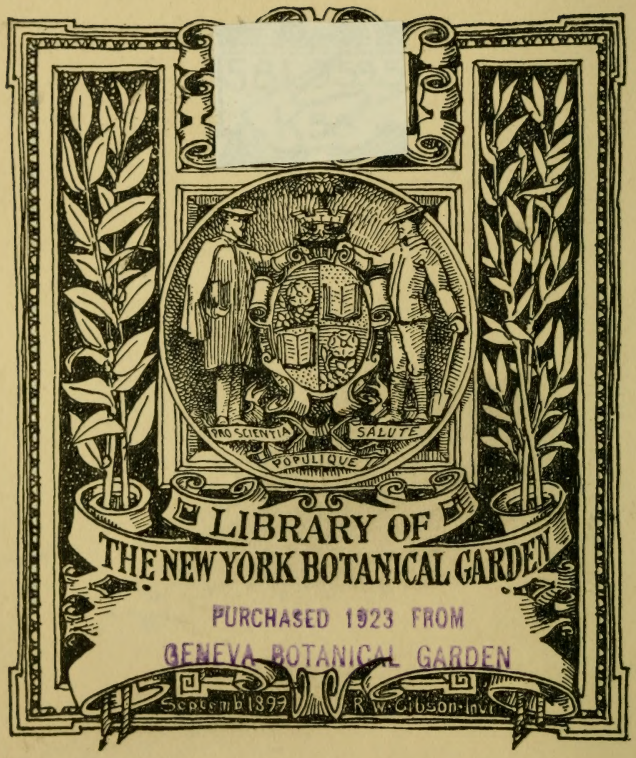
7B


PRO SCIENTIA
SALUTE
POPULIQUE
LIBRARY OF
THE NEW YORK BOTANICAL GARDEN
PURCHASED 1923 FROM
GENEVA BOTANICAL GARDEN
Septemb 1899
R.W. Gibson Inv.

DUPLICATA DE LA BIBLIOTHÈQUE
DU CONSERVATOIRE BOTANIQUE DE GE
VENDU EN 1922

CONSERVATOIRE
BOTANIQUE
VILLE de GENÈVE

MATERIALS

FOR A

FLORA

OF THE MALAYAN PENINSULA

BY

GEORGE KING, K.C.I.E., LL.D., F.R.S.,

LATE SUPERINTENDENT OF THE ROYAL BOTANIC GARDEN, CALCUTTA.

CALYCIFLORÆ

(Nos. 9 to 13 of the series).

CONSERVATOIRE
BOTANIQUE
VILLE de GENÈV

LIBRARY
NEW YORK
BOTANICAL
GARDEN

CALCUTTA

ROYAL BOTANIC GARDEN.

1902.

DUPLICATA DE LA BIBLIOTHÈQUE
DU CONSERVATOIRE BOTANIQUE DE GE
VENDU EN 1922

QK354.7
.K55
no.9-13

PREFACE.

The papers contained in this volume originally appeared, like their predecessors, in the *Journal of the Asiatic Society of Bengal.* For the convenience of Botanists I had separate copies of each of these papers printed off as it appeared, and these are now issued as a volume dealing with the *Calyciflorœ* as its two predecessors dealt respectively with *Thalamiflorœ* and *Disciflorœ.* Each page of the volume bears two numbers. The one at the top of the page is that of the volume of the *Journal* in which the paper originally appeared. This number is not referred to in the Index, but it is the one which ought to be used by any one quoting this work. *The numbers at the bottom of the pages (which run continuously) are those used in the index.*

The dates of the publication of the five papers included in the present volume are as follows :—

No.	9,	pages	1	to	344,	*Journ. As. Society, Bengal,*	No. 1,	1897.
„	10,	„	345	to	408,	„ „ „	No. 1,	1898.
„	11,	„	409	to	495,	„ „ „	No. 1,	1900.
„	12,	„	496	to	572,	„ „ „	No. 1,	1901.
„	13,	„	573	to	608,	„ „ „	No. 1,	1902.

The order *Leguminosæ* was written by my friend and colleague Dr. D. Prain, and the genus *Sonerila* (N. O. *Melastomaceæ*) was done in collaboration with my friend Dr. O. Stapf, of the Kew Herbarium. The rest of the book is my own work.

It may be useful to repeat that, throughout this work, the length given for a leaf is that of the blade only, the measurements of the petiole (if any) being given separately; and that the breadth given for a leaf is that of its broadest part.

From the Journal, Asiatic Society of Bengal, Vol. LXVI. Part II, No. 1, 1897.

LIBRARY
NEW YORK
BOTANICAL
GARDEN

Materials for a Flora of the Malayan Peninsula.—*By* GEORGE KING, LL.D., F.R.S., C.I.E., *Superintendent of the Royal Botanic Garden, Calcutta.*

No. 9.

With the last part of these *Materials* the account of the *Discifloræ* of the Malayan Peninsula was concluded; and in the present part that of the *Calycifloræ* is begun. My progress has (owing to the press of official and of other work) been even slower than I anticipated when I began the publication of these *Materials* now more than seven years ago. I therefore invoked the aid of my excellent friend and colleague Dr. D. Prain, and he, in response to my appeal, generously undertook the elaboration of the important family of *Leguminosæ* which forms so large a portion of the present paper. It is hoped that one more contribution similar in size to the present one will suffice to complete the account of the *Calycifloræ*, and so to bring the whole series about half way towards completion.

AUG 7 - 1923

Order XXXVII. CONNARACEÆ.

Erect or climbing shrubs or trees. *Leaves* alternate, exstipulate, 1–3-foliolate or unequally-pinnate; leaflets quite entire. *Flowers* in racemes panicles or cymes, regular or subregular, usually bisexual. *Calyx* 5-lobed or -partite, usually persistent, imbricate or valvate. *Petals*

5, usually narrow, free or slightly cohering, very rarely valvate. *Stamens* perigynous or hypogynous, sometimes declinate, 5 or 10, those opposite the petals often shorter and imperfect; filaments often connate at the base. *Disc* 0 or small, annular or incomplete. *Pistils* 5, rarely 1–3 or 6–7, ovoid, hirsute, 1-celled; styles subulate or filiform, stigmas capitellate, simple or 2-lobed; ovules 2, collateral, ascending, orthotropous. *Fruit* usually of 1, rarely 2–3, sessile or stalked, 1- rarely 2-seeded follicles. *Seed* erect, usually arillate, testa thick, usually more or less covered by an arillus which is often very thin; cotyledons fleshy in the exalbuminous, leafy in the albuminous seeds; radicle superior, rarely ventral.—DISTRIB. 14 genera, all tropical.

Seeds exalbuminous, arillate.
- Pistils solitary.
  - Leaves pinnate, leaflets 3 to 11; trees or scandent shrubs ... ... 1. CONNARUS.
  - Leaflet solitary, small trees or shrubs, never scandent 2. ELLIPANTHUS.
- Pistils 5 but usually only 1 perfect: leaves pinnate, (leaflet solitary in one species of *Rourea*).
  - Flower-pedicels ebracteolate: follicle curved; lobes of calyx persistent, slightly accrescent, imbricate and forming a cup at the base ... ... 3. ROUREA.
  - Flower-pedicels with persistent bracteoles at their bases, follicle not curved; calyx-lobes persistent, but neither accrescent nor imbricate ... ... 4. ROUREOPSIS.
- Pistils 2 to 5, perfect.
  - Calyx imbricate; follicles rugose, laminate or tubercled 5. AGELÆA.
  - Calyx valvate; follicles neither rugose laminate nor tubercled ... ... 6. TÆNIOCHLÆNA.

Seeds albuminous, pistils 5 to 7, follicles 1 to 3, arillus thin 7. CNESTIS.

1. CONNARUS, Linn.

Trees or (usually scandent) shrubs. *Leaves* unequally pinnate; leaflets 5, rarely 3 or more, quite entire. *Panicles* axillary and terminal, branched. *Flowers* small. *Sepals* 5, deciduous or persistent and clasping the pedicel of the capsule but not accrescent, imbricate. *Petals* 5, linear or slightly dilated upwards. *Stamens* 10, 5 shorter and sometimes without anthers. *Ovary* 1, densely pubescent, style slender, stigma capitellate. *Capsule* oblique, stipitate, inflated, broader upwards; valves glabrous or pubescent within. *Seeds* arillate, testa shining, albumen 0; cotyledons amygdaloid.—DISTRIB. Species about 80, all tropical.

- Petals minute, much shorter than the sepals ... ... 1. *C. Maingayi.*
- Petals longer than the sepals.
  - Under surfaces of the leaflets and the follicles externally densely rusty-pubescent, upper surfaces of leaflets sparsely pubescent ... ... 2. *C. ferrugineus.*

Under surfaces of leaflets pubescent, upper surfaces and adult follicles externally glabrous ... ... 3. *C. semidecandrus.*
Both surfaces of the leaflets quite glabrous.
Leaflets ovate-lanceolate or elliptic-lanceolate, acuminate, 2 to 4 in. long.
Follicles sub-cylindric, tapering at the ends, not compressed, minutely sericeous inside ... ... 4. *C. oligophyllus.*
Follicles compressed, sparsely stellate-hairy inside .. 5. *C. hebephyllus.*
Leaflets broadly ovate with very rounded bases; petals pubescent; follicles 1·5 in. long, pubescent inside ... 6. *C. nicobaricus.*
Leaflets elliptic-oblong or elliptic, 3 to 12 in. long; petals glabrous.
Main nerves of leaves 6 or 7 pairs; follicles 1·25 to 1·4 in. long, sericeous inside ... 7. *C. gibbosus.*
Main nerves of leaves 9 or 10 pairs; follicles 1·5 to 1·75 in. long, sericeous inside ... ... 8. *C. grandis.*
Main nerves of leaves 5 pairs; follicles 2·5 in. long, pubescent inside ... ... 9. *C. ellipticus.*

1. Connarus Maingayi, Hook. fil. Fl. Br. Ind. II, 53. A small tree; young branches minutely rusty-tomentose. *Leaves* 6 to 8 in. long, their rachises densely and minutely tomentose; leaflets 7 to 9, coriaceous, elliptic-oblong, obtusely and shortly acuminate, the base rounded or sub-cuneate, both surfaces distinctly reticulate when dry, the upper glabrous, the lower paler and sparsely adpressed-pubescent, the midrib tomentose; main nerves 7 to 11 pairs, spreading, faint; length 2·25 to 3·25 in., breadth 1 to 1·35 in., petiolules ·1 to ·15 in. *Panicles* axillary and terminal, longer than the leaves, densely and minutely rusty-tomentose; the branches short, spicate, with the flowers clustered near the apices. *Flowers* about ·15 in. long, and the same in diameter, on pedicels shorter than themselves. *Sepals* oblong, laterally inflexed at the apex, hoary-pubescent outside, glabrous inside, connivent. *Petals* minute, much shorter than the sepals and shorter than the stamens, pale-pubescent in front. *Stamens* 10; the anthers almost sessile, broadly ovate, glabrous. *Pistil* solitary, the ovary sericeous like the disc, the style short and stout. *Fruit* not seen.

Perak; King's Collector, No. 3106.

This is readily distinguished from every *Connarus* described here by its very minute petals. In leaves it approaches *C. oligophyllus*, but is distinguished from that by its pinnate nervation.

2. Connarus ferrugineus, Jack in Mal. Misc. 2, VII, 37. A sarmentose shrub or powerful woody climber as much as 80 feet long; young branches, petioles, rachises, under-surfaces of leaves and inflorescence densely rusty-tomentose. *Leaves* 8 to 16 in. long; leaflets 5 to 11, coriaceous, oblong-lanceolate or oblong-oblanceolate, shortly acumi-

nate, narrowed in the lower fourth to the rounded or sub-cordate base; upper surface rugose and, even when adult, clothed with sparse thin hairs; when old glabrous, the midrib and nerves depressed and tomentose; under-surface rusty-tomentose; main nerves 6 or 7 pairs, oblique, curved, prominent beneath; length 3 to 6 in., breadth 1·25 to 2 in., petiolules ·1 to ·15 in. *Panicles* terminal, shorter or longer than the leaves; the branches rather short, stout. *Flowers* crowded, ·3 in. long, on pedicels much shorter than themselves. *Sepals* oblong-ovate, tomentose outside, glabrous inside. *Petals* linear-oblong, glabrous. *Stamens* 10, alternately long and short, the filaments glabrous. *Ovary* oblong, tomentose, style short. *Follicle* obovoid-oblong, shortly apiculate, tapering to the base, red when ripe, densely rusty-tomentose, 1·75 to 2·25 in. long and ·8 to 1·25 in. broad; pericarp woody, densely sericeous inside. *Seed* narrowly oblong, 1 in. long and ·6 in. broad, black, shining, with a basal incomplete arillus ·5 in. long. Planchon in Linnæa, Vol. XXIII, 429; Hook. fil. Fl. Br. Ind. II, 51. *Tricholobus ferrugineus*, Blume Mus. Bot. Lugd. Bat. I. 237. *Connaracea*, Wall. Cat. 8530.

In all the provinces except the Andaman and Nicobar Islands.—Distrib. Sumatra.

I see no character to separate Blume's genus *Tricholobus* from *Connarus*, and I therefore follow Sir Joseph Hooker in adhering to Jack's name for this plant.

3. Connarus semidecandrus, Jack in Mal. Misc. 2, VII, 39. A sarmentose or often scandent shrub; young branches deciduously puberulous. *Leaves* 6 to 9 in. long, their rachises and the under-surfaces of the leaflets with their petiolules pubescent or puberulous; leaflets 5 to 7, thinly coriaceous, oblong to elliptic-lanceolate, shortly caudate-acuminate, the base cuneate or rounded; upper surface quite glabrous; the lower reticulate, the pubescence often deciduous with age; main nerves 6 or 7 pairs, prominent on the lower surface, spreading but curving upwards, the lower pair very oblique; length 2·5 to 4·5 in., breadth ·9 to 2·5 in., petiolules ·15 in *Panicles* axillary and terminal, longer than the leaves, much branched, densely and minutely rusty-tomentose. *Flowers* rather crowded, ·2 in. long, on pedicels shorter than themselves. *Sepals* oblong, obtuse, concave, pubescent outside, shorter than the glabrous linear-oblong petals. *Stamens* 10, in two rows, one row very short, the other with its filaments dilated at their bases and as long as the petals. *Pistil* single, shorter than the stamens, the ovary hairy; the style short, stout, pubescent; stigma sub-capitate. *Follicles* falcate, obovoid, compressed, with a short abrupt apical point, narrowed to a stalk at the base, at first rusty-pubescent, afterwards glabrous, obliquely striate, about ·75 to ·9 in. long and ·5 in. broad; pericarp thin, sparsely

sericeous internally. *Seed* with a short basal arillus. Hook. fil. Fl. Br. Ind. II, 52; Kurz For. Flora Burma, II, 326. *Connarus floribundus*, Wall. Cat. 8543 (in part), 8541, B.

In all the provinces except the Nicobars and Andamans.—DISTRIB. Sumatra.

This species is easily distinguished when in fruit by the small size of its follicles. But, while in flower, it is not easy to separate it from *C. gibbosus*, Wall.; the only distinctions that I can find being that, in the latter, the follicles are larger than in this, and that the leaflets are quite glabrous on both surfaces.

4. CONNARUS OLIGOPHYLLUS, Wall. ex Planch. in Linnæa, XXIII, 427. Scandent, glabrous except the inflorescence. *Leaves* 6 to 8 in. long; leaflets 3 to 5, coriaceous, elliptic-lanceolate to elliptic-oblong, sub-acute or shortly and bluntly acuminate, the base cuneate or rounded; upper surface shining; the lower paler, dull; main nerves 4 or 5 pairs, ascending (especially the lower 2 pairs), curved, slightly prominent on the lower surface, very faint on the upper; length 2·25 to 4 in., breadth 1 to 2 in., petiolules ·25 to ·3 in. *Panicles* terminal and longer than the leaves or lateral and shorter, sub-pyramidal, much branched, minutely rusty-pubescent, many-flowered. *Flowers* ·35 in. long, sub-sessile or on short pedicels. *Sepals* ovate-lanceolate, acute, much shorter than the oblong obtuse puberulous petals; perfect ovary 1, flask-shaped, puberulous. *Follicle* nearly straight, not compressed, cylindric, tapering to each end, glabrous and vertically striate (when dry) outside, the pericarp coriaceous, minutely sericeous internally, 1·5 to 2 in. long and ·75 in. in diam. at the middle. *Seed* shining, black. Hook. fil. Fl. Br. Ind. II, 53. *Connaracea*, Wall. Cat. 8542 (*in part*) and 8539 D. (*in part*).

Penang; Porter. Perak; Wray, No. 1942. King's Collector, Nos. 5232, 5613, 7804, 8335, 8432. Scortechini, No. 1057. Singapore; Ridley, No. 5904. Malacca; Maingay, Nos. 506, 508/2, 513.

5. CONNARUS HEBEPHYLLUS, n. spec. King. A powerful climber; young branches deciduously rusty-pubescent; the bark pale, sparsely lenticellate. *Leaves* 6 to 12 in. long, their rachises glabrous; leaflets coriaceous, ovate-lanceolate, acuminate, the base rounded or slightly cuneate; both surfaces glabrous, dull, the lower pale and faintly reticulate; main nerves 6 or 7 pairs, spreading, curving upwards; length 2 to 4 in., breadth ·75 to 1·35 in.; petiolules about ·2 in., rugulose, glabrous, pale. *Panicles* terminal and axillary, shorter than the leaves in flower, as long as or longer than them in fruit; the branches short, densely rusty-tomentose. *Flower-buds* obovate, on short pedicels. *Calyx* densely rusty-tomentose outside. *Petals* glabrous. *Stamens* 5 long and 5 minute. *Follicles* when young rusty-tomentose, when ripe

glabrous externally except along the suture, broadly oblong, blunt at both ends, somewhat compressed, obliquely striate, attenuated to a very short grooved pseudo-stalk, rosy-red when ripe, sparsely stellate-hairy inside; length 1·25 in., breadth ·85 in.; the pericarp thin, coriaceous, glabrous inside. *Seed* narrowly oblong, blunt, with a short arillus at its base.

Perak; Wray, No. 1858. King's Collector, Nos. 5586, 6517, 7519.

6. Connarus nicobaricus, King n. spec. Scandent, woody, all parts except the inflorescence glabrous; young branches with pale smooth bark. *Leaves* 8 to 10 in. long; leaflets thinly coriaceous, 3 to 5, broadly ovate with a very short blunt apical point, the base broad and rounded; upper surface slightly shining, the lower duller and paler; main nerves 6 or 7 pairs, faint, curving upwards; length of lateral leaflets 2·75 to 4·5 in., breadth 1·5 to 2·75 in.; petiolules about ·25 in., the terminal leaflet larger. *Panicles* terminal (probably also axillary), nearly as long as the leaves, rusty-pubescent, the branches sub-erect. *Flowers* crowded near the ends of the branchlets, ·35 in. long, on pedicels much shorter than themselves. *Calyx-segments* ovate, tomentose outside, glabrous inside, about one-fourth as long as the corolla. *Petals* linear, pubescent on both surfaces. *Stamens* 10, in two rows, the longer row much shorter than the style and petals; filaments sparsely pubescent, swollen near the base. *Pistil* as long as the petals; the ovary broadly ovoid, tomentose; style sparsely pubescent. *Stigma* sub-capitate. *Follicle* broad, sub-compressed, obtuse, glabrous, faintly striate longitudinally, 1·5 in. long, and nearly 1 in. broad, pubescent inside.

Nicobar Islands; King's Collectors.

Allied to *C. gibbosus*, Wall., but with pubescent petals and larger follicles which are pubescent inside.

7. Connarus gibbosus, Wall. Cat. 8541 (*in part*). A large semi-scandent shrub; young branches deciduously rusty-puberulous. *Leaves* 6 to 9 in. long, quite glabrous; leaflets 3 to 5, thinly coriaceous, elliptic or elliptic-oblong, very shortly and obtusely acuminate, the base rounded; both surfaces shining, the lower reticulate; main nerves 6 or 7 pairs, spreading but curving upwards, the lower pairs very oblique, slightly prominent on the lower surface; length 3 to 5 in., breadth 1·25 to 2·5 in., petiolules ·2 to ·3 in. *Panicles* axillary and terminal, shorter than or as long as the leaves, many-branched, rusty-pubescent. *Flowers* rather crowded on the short ultimate branchlets, ·25 in. long, on pedicels shorter than themselves. *Sepals* and *petals* as in *C. semidecandrus*. *Stamens* 10, the one row only slightly shorter than the other. *Pistil* longer than the stamens and petals; the ovary ovate-rotund, rusty-tomentose, the style pubescent; stigma sub-capitate. *Follicles*

sub-rhomboidal, compressed, with a short stout apical point, glabrous, obliquely striate; pericarp leathery inside, sericeous, 1·25 to 1·4 in. long, and about 1 in. broad, the stalk ·4 in. long. *Seed* nearly 1 in. long, oblong, blunt at both ends, black, with an arillus obliquely covering its lower half. Hook. fil. Fl. Br. Ind. II, 52; Kurz For. Flora Burma, II, 326.

The Andaman Islands.—Distrib. Burma.

This may be distinguished from *C. semidecandrus* by its larger follicles, and larger seeds much more extensively covered by arillus. The inner surface of the pericarp in this is glabrous; in *C. semidecandrus* it is sparsely sericeous.

8. Connarus grandis, Jack in Mal. Misc. 2, VII, 40. Scandent, all parts except the inflorescence quite glabrous. *Leaves* 9 to 12 in. long, their rachises stout; leaflets 3 to 5, very coriaceous, elliptic-oblong, acute or obtusely acuminate, the base rounded or sub-cuneate; both surfaces, but especially the upper, shining, the lower reticulate when dry; main nerves 9 or 10 pairs, oblique, faint; length 4 to 12 in., breadth 1·5 to 4 in.; petiolules of the lateral leaflets about ·5 in., of the terminal ·75 in. *Panicles* often as long as the leaves, terminal or axillary, spreading, with a few spike-like branches, rusty-tomentose. *Flowers* sessile, ·25 in. long *Sepals* tomentose outside, linear-oblong, obtuse. *Petals* twice as long, linear, dilated upwards, glabrescent. *Filaments* puberulous. *Follicles* obliquely ovoid, sub-rhomboidal, compressed, glabrous, slightly and obliquely rugulose when dry, tapering to a short pseudo-stalk, 1·5 to 1·75 in. long, and about 1 in. broad; pericarp woody, sericeous inside. Planchon in Linnæa, XXIII, 429; Hook. fil. Fl. Br. Ind. II, 53. *C. Wallichii*, Planch. l. c. 426; Kurz For. Flora Burma, I, 328. *Connaracea*, Wall. Cat., 8538 A. B. (*in part*).

In all the provinces except the Nicobars and Andamans.

9. Connarus ellipticus, King n. spec. Scandent; young branches deciduously rusty-pubescent, the bark dark and polished. *Leaves* 8 to 15 in. long, everywhere glabrous; leaflets coriaceous, 3 to 5, elliptic-oblong to elliptic, acute or shortly acuminate, the base rounded or sub-cuneate, upper surface very shining when dry; the lower paler, reticulate and less shining; main nerves 5 pairs, oblique, rather prominent beneath; length 4·5 to 7 in., breadth 2 to 3 in.; petiolules ·2 to ·3 in., rugulose, pale. *Panicles* axillary and shorter, or terminal and longer than the leaves, minutely rusty-pubescent, the branches obliquely spreading, the ultimate branchlets short. *Flowers* ·25 in. long, on pedicels slightly shorter than themselves. Segments of the *calyx* ovate-lanceolate, acute, rusty-tomentose outside, glabrescent inside, about as long as the pistil and half as long as the linear acute glabrous petals. *Stamens* 5 perfect nearly as long as the petals, and 5 abortive (without

anthers) shorter than the pistil; filaments glabrescent or glabrous, those of the perfect stamens dilated at the base. *Ovary* pubescent, *style* glabrous, *stigma* discoid-capitate. *Follicles* broad, obliquely subrhomboid, tapered to the base, the dorsal suture straight and ending in a conical point, the ventral compressed and widely curved, glabrous, red when ripe, 2·5 in. long and 1·5 in. broad; pericarp woody, adpressed-pubescent on its inner surface. *Seed* oblong, flat; the testa black, half covered by a thin basal arillus. *Erythrostigma ellipticum*, Zoll. in Tijdsch. Ned. Ind. XIV, 174.

Singapore; Ridley, No. 1380. Perak; King's Collectors, Nos. 4090, 4943, 5958, 7480, 8435. Wray; Nos. 1831, 2870, 2873; Scortechini, No. 1689. Penang; Curtis.

There is a specimen in the Calcutta Herbarium collected by Kurz in the Buitenzorg garden which exactly agrees with this. That specimen is named *Erythrostigma ellipticum* Zoll.; and it is on the strength of this identification of Kurz's that I have included this synonym here. For Zollinger (who refers the genus *Erythrostigma* to *Anacardiaceæ*) defines his three species (l. c.) *E. ellipticum*, *E. obliquum* and *E. villosum* so briefly and imperfectly, that it is quite impossible, from his descriptions alone, to identify any of them.

2. Ellipanthus, Hook. f.

Trees or erect shrubs. *Leaves* with 1 leaflet, quite entire. *Racemes* or *cymes* axillary, short. *Flowers* hermaphrodite or polygamous. *Sepals* 5, not enlarged in fruit, sub-erect, valvate. *Petals* 5, longer than the sepals, oblong-lanceolate, densely pubescent. *Stamens* 10, 5 shorter without anthers; filaments short, subulate, connate at the base. *Ovary* 1, pubescent; style short. *Follicle* stalked, oblique, velvetty; valves glabrous within. *Seed* arillate, albumen 0; cotyledons plano-convex.—Distrib. 12 species; Malayan Peninsula and Islands.

Both surfaces of leaves quite glabrous.
Leaflet narrowly elliptic-oblong, tapering to each end; follicles ·5 in. long ... ... 1. *E. Scortechinii.*
Leaflet elliptic-ovate to elliptic; follicle 1 in. long ... 2. *E. calophyllus.*
Under surfaces of leaves hairy.
Leaflet oblong-lanceolate, 2·5 to 3·5 in. long; flowers in short panicles ... ... 3. *E. Curtisii.*
Leaflets ovate- or oblong-elliptic to elliptic, 4 to 6 in. long.
Flowers in racemes, follicle with a pseudo-stalk only ·2 in. long ... ... 4. *E. Griffithii.*
Flowers in dense capituloid cymes; follicle gibbous at the base on one side, its pseudo-stalk about 1 in. long .. 5. *E. gibbosus.*

1. Ellipanthus Scortechinii, King n. spec. A small tree; young branches with pale cinereous bark, pubescent. *Leaflet* thinly coriaceous, narrowly elliptic-oblong, tapering from the middle to either end, the

apex caudate-acuminate; both surfaces glabrous, the upper shining; the lower dull, minutely reticulate; main nerves 4 pairs, curved, ascending, prominent on the lower surface; length 4·5 to 7 in., breadth 1·25 to 2 in., petiole ·1 to ·15 in. *Cymes* axillary, very short, tawny-tomentose. *Calyx* thick; the lobes deep, ovate, obtuse, cinereous-tomentose. *Petals* slightly longer than the calyx, membranous. *Follicles* cinereous-tomentose, obliquely elliptic, sub-compressed, grooved along the suture, almost straight, the apex rather blunt with an abrupt small apiculus, the base slightly and suddenly contracted into a short stout pseudo-stalk covered by the persistent calyx; length ·5 in., breadth ·3 in.; pericarp thick, glabrous inside. *Seed* oblong with a large hilum and thin arillus.

Perak; Scortechini No. 607.

Gathered only by the late Father Scortechini whose specimens are in fruit, and from whose field notes the foregoing description of the flower has been taken.

2. Ellipanthus calophyllus, Kurz Andam. Report, Append. B. 6. A small tree; young branches slender, glabrous. *Leaflet* coriaceous, elliptic to elliptic-ovate, sometimes oblong-lanceolate, shortly caudate-acuminate, the base rounded or slightly and abruptly cuneate; both surfaces glabrous; the upper shining when dry; the lower dull, minutely reticulate; main nerves 4 or 5 pairs, spreading, curving upwards, inter-arching freely; length 4·5 to 6·5 in., breadth 2 to 2·25 in.; petiole ·75 to 1 in., the joint near the apex. *Cymes* axillary, shorter than the petioles, minutely tawny-tomentose. *Flowers* ·3 in. long, on pedicels shorter than themselves. *Calyx lobes* broadly ovate, sub-acute, tawny-tomentose outside, less than half as long as the linear-oblong densely velvetty obtuse petals. *Stamens* the 5 perfect shorter than the petals and with very pubescent filaments; the 5 abortive much shorter and more slender, anantherous. *Ovary* narrowly ovoid, sericeous. *Style* rather short, stigma sub-capitate. *Follicles* obovoid or ellipsoid, slightly compressed, blunt, rusty-tomentose, 1 in. long; pericarp thick, woody, glabrous within; Kurz Journ. As. Soc. Beng. 1872, Pt. II, 305; For. Flora Burma I, 329; Hook. fil. Fl. Br. Ind. II, 55.

Andaman Islands; Kurz, King's Collectors.

3. Ellipanthus Curtisii, King n. spec. A tree; young branches rusty-puberulous, the bark dark. *Leaflet* thinly coriaceous, oblong-lanceolate, tapering to each end, the apex caudate-acuminate; upper surface glabrous, shining; the lower reticulate, sparsely pubescent, the midrib tomentose; main nerves 7 or 8 pairs, curving obliquely upwards, prominent beneath; length 2·5 to 3·5 in., breadth ·8 to 1·5 in., petiole ·3 in., tomentose. *Panicles* axillary, branching from the base, ·5 to ·7 in. long, sericeous. *Flowers* ·2 in. long, on pedicels shorter than themselves. Segments of the *calyx* ovate-lanceolate, thick, tomentose on the outer,

glabrescent on the inner surface, less than half as long as the petals and pistil. *Petals* narrowly oblong, sub-acute, pubescent on the outer, glabrescent on the inner surface. The 5 fertile *stamens* as long as the ovary, glabrous, the anthers broadly ovate, the filaments much dilated at the base, the 5 alternate much smaller and without anthers. *Ovary* oblong, sericeous-tomentose, longer than the stout pubescent style; stigma capitate-discoid. Fruit unknown.

Penang; Curtis Nos. 1014, 1097.

The nearest ally of this appears to be the imperfectly known ***E. Helferi***, Hook. fil. from Tenasserim, of which the type is Helfer's No. 1253; but the leaves of this are much more pubescent on the lower and more shining on the upper surface. The flowers of this are moreover larger.

4. ELLIPANTHUS GRIFFITHII, Hook. fil. Fl. Br. Ind. II, 56. A small tree? Young branches slender, rusty-pubescent. *Leaflet* thinly coriaceous, ovate-elliptic, caudate-acuminate, the base abruptly sub-cuneate; upper surface glabrous, shining, the lower sparsely rusty-pubescent, the midrib and nerves almost tomentose; main nerves 9 or 10 pairs, spreading, interarching, prominent beneath; length 4 to 5 in., breadth 1·5 to 2 in., petiole ·2 to ·25 in. *Racemes* ·25 in. long, few-flowered; calyx deeply divided into 5 ovate-lanceolate teeth, adpressed-pubescent. Follicles compressed, much curved, the apex beaked, narrowed at the base to a pseudo-stalk ·2 in. long which is embraced by the persistent calyx, rufous tomentose outside, ·75 in. long; the pericarp coriaceous, glabrous inside.

Mallacca; Griffith No. 1253.—DISTRIB. Borneo.

5. ELLIPANTHUS GIBBOSUS, King n. spec. A small tree; young branches slender, rusty-tomentose. *Leaflet* elliptic or oblong-elliptic, sometimes slightly obovate, shortly and rather abruptly caudate-acuminate, the base cuneate; upper surface quite glabrous; the lower sparsely adpressed-pubescent, the midrib densely so; main nerves 7 or 8 pairs, spreading but curved upwards, prominent on the lower surface when dry; length 4·5 to 6·5 in., breadth 1·75 to 2·75 in., petiole ·5 or ·6 in. long, tomentose, stout, the joint near the apex. *Flowers* ·15 in. long, in dense many-flowered capituloid axillary cymes, sub-sessile. *Calyx-teeth* lanceolate, tawny-tomentose externally, glabrous internally. *Petals* broader than the sepals and sometimes also longer, imbricate, tomentose outside, glabrous inside. *Stamens* 5 or 6 fertile with broadly ovate anthers, and 5 alternate smaller and abortive; the filaments of all united by their expanded bases. *Ovary* villous, style about as long as the stamens, stigma discoid. *Follicle* narrowly oblong, compressed, the apex produced into a long conical beak; the base gibbous at one side, contracted below the gibbosity into a curved pseudo-stalk about an inch

long, everywhere pale rusty-tomentose; length of follicle and beak equal to that of the pseudo-stalk; pericarp leathery, glabrous inside. *Seed* arillate at the base, testa black.

Perak; very common, Scortechini, Wray, Curtis, King's Collectors.

3. Rourea, Aubl.

Scandent or sarmentose shrubs. *Leaves* unequally pinnate, sometimes with only one leaflet; leaflets subopposite or alternate. *Racemes or panicles* axillary. *Flowers* small; pedicels usually slender. *Sepals* 5, orbicular, imbricate, enlarged and clasping the base of the ripe capsule. *Petals* 5, usually linear-oblong. *Stamens* 10; filaments connate at the base. *Ovaries* 5, 4 usually imperfect; style slender. *Follicle* sessile, curved. *Seed* erect, arillate, exalbuminous.—Distrib. Tropics; species about 52.

Leaflets not more than 7, petiolulate, glabrous.	
Leaves with usually a single leaflet	1. *R. anomala.*
Leaves with 3 to 9, rarely 11, leaflets; inflorescence ebracteolate, or the bracteoles (if any) fugacious.	
Leaflets glaucous on the lower surface	2. *R. acuminata.*
Leaflets not glaucous on the lower surface.	
Leaves 8 to 12 in. long; leaflets elliptic-lanceolate to elliptic, their main nerves 2 to 5 pairs, curving abruptly upwards; flowers ·35 in. in diam., in racemes or panicles, flower buds ovoid	3. *R. commutata.*
Leaves 3 to 7 in. long; leaflets ovate-lanceolate, their main nerves 4 or 5 pairs, faint, spreading; flowers ·25 in. in diam.; flower buds ovoid	4. *R. pulchella.*
Leaves 3·5 to 6 in. long; leaflets 3 rarely 5, broadly ovate or ovate-orbicular with broad rounded bases; their main nerves about 4 pairs, spreading, faint; flower-buds globose	5. *R. humilis.*
Leaflets very numerous (17 to 40), small, sessile, oblong.	
Leaflets shortly and bluntly acuminate, pubescent beneath...	6. *R. rugosa.*
Leaflets bifid at the apex, minutely dotted and sparsely pubescent beneath	7. *R. parallela.*
Leaflets with obtuse rounded apices.	
Lower surface of leaflets rusty-sericeous	8. *R. fulgens.*
Lower surface of leaflets minutely dotted, reticulate, glabrous	9. *R. concolor.*

1. Rourea anomala, King n. spec. A powerful woody perfectly glabrous creeper. *Leaves* either simple or ternate; leaflets coriaceous, ovate-elliptic to broadly ovate, shortly and bluntly caudate-acuminate, the base rounded and usually broad; both surfaces shining and minutely reticulate when dry; main nerves about 6 pairs, curving upwards,

faint; length of the simple leaves and of the terminal leaflet of the ternate leaves 3·25 to 4·5 in., breadth 1·6 to 2·2 in.; petiolules about ·2 in., those of the lateral leaflets shorter. *Racemes* slender, shorter than the leaves, in fascicles in the leaf-axils, laxly-flowered. *Flowers* ·35 in. long, on slender pedicels of about the same length. *Segments of calyx* ovate-orbicular, sub-oblique, puberulous outside, their edges ciliate, only about one-third of the length of the linear-oblong glabrous petals. *Stamens* much shorter than the petals and than the glabrous pistils. *Follicles* obliquely ovoid, sub-compressed, blunt, yellowish with a red tinge when ripe, 1 in. long. *Seed* with a soft red arillus.

Penang; Curtis No. 504. Perak; King's Collector Nos. 804, 953, 3066, 3866, 4527, 4622, 6755, 8312, 10542, 10863. Wray, No. 3799; Scortechini.

This resembles *R. simplicifolia* Bl. in having both simple and compound leaves; but that is a smaller plant with puberulous inflorescence, and different follicles.

2. Rourea acuminata, Hook. fil. Fl. Br. Ind. II, 48. A powerful woody perfectly glabrous creeper often over 100 feet long; young branches glabrous, often minutely lenticellate. *Leaves* 3 to 9 in. long, the rachis slender; leaflets 5 to 11, thinly coriaceous, oblong, lanceolate or elliptic-oblong, sometimes somewhat obovate, abruptly shortly and bluntly caudate-acuminate, slightly narrowed to the rounded base or with broad minutely cordate base; upper surface shining, the lower dull and glaucous, both minutely reticulate when dry; main nerves about 5 pairs, very faint, spreading; length 1·5 to 2·25 in., breadth ·65 to ·9 in.; petiolules under ·1 in., the terminal one slightly larger. *Racemes* very slender, lax, several from an axil. *Flowers* ·3 in. long, on slender pedicels of about the same length. *Sepals* ovate-rotund, about half as long as the narrowly oblong glabrous sepals, glabrous, the edges minutely ciliolate. *Stamens* shorter than the petals and glabrous pistils. *Follicle* narrowly ovate, curved, pointed, ·75 in. long, when ripe red tipped with yellow. *Cnestis acuminata*, Wall. Cat. 8533.

Singapore; Wallich. Perak; King's Collector Nos. 866, 4271, 6987, 7781, 10599, 10871.

3. Rourea commutata, Planch. in Linnaea, XXIII, 420. Shrubby, scandent; young branches puberulous becoming glabrous, sometimes minutely lenticellate. *Leaves* 8 to 12 in. long, glabrous; leaflets 3 to 7, thinly coriaceous, sub-opposite, elliptic-lanceolate to elliptic, sub-obtusely caudate-acuminate, the base rounded, both surfaces shining; main nerves 2 to 5 pairs, curved, rather abruptly ascending; length 2·5 to 6 in., breadth 1·35 to 2·25 in.; petiolules ·15 to ·2 in., the terminal one larger. *Flowers* ·35 in. in diam., in glabrous racemes or racemoid panicles much shorter than the leaves and clustered in their axils, pedicels

shorter than the flowers. *Sepals* broadly ovate, blunt, pubescent. *Petals* linear-oblong, broadly ovate. *Stamens* 10, alternately shorter than the filaments, expanded towards the base and united by their edges; ovaries slightly hairy on the inner side, styles glabrous. *Follicles* obliquely ovate-oblong, pointed, coriaceous, glabrous, ·75 to 1 in. long. *Seed* ovate, covered by an orange-coloured arillus. Hook. fil. Fl. Br. Ind. II, 47; Kurz For. Flora Burma I, 324. *Cnestis monadelpha*, Roxb. Fl. Ind. II, 454. *Connaracea*, Wall. Cat., 8547, 8548.

Andaman and Nicobar Islands.—DISTRIB. Burma, Chittagong, Sylhet and Assam.

The present species (published in 1850), *R. pulchella*, Blume (1850), and *L. humilis*, Planch. (1850), differ from each other so little that I am not sure that they should not be reduced to one, in which case the species might be named *Rourea monadelpha*, the earliest published name of any of them being *Cnestis monadelpha*, Roxb. (1832).

4. ROUREA PULCHELLA, Planch. in Linnaea XXIII, 419. Scandent, woody, quite glabrous. *Leaves* 3 to 7 in. long; leaflets 3 to 7, thinly coriaceous, ovate-lanceolate, obtusely caudate-acuminate, the upper surface very shining, the lower less so, both reticulate; main nerves 4 or 5 pairs, spreading, faint; length 1·5 to 3 in., breadth ·75 to 1·6 in.; petiolules ·15 in., slender. *Racemes* crowded in the axils, shorter than the leaves. *Flowers* ·25 in. in diam., the pedicels of the same length, slender. *Sepals* broadly ovate, acute, ciliolate, half as long as the petals, linear-oblong. *Pistils* 5, ovaries pilose, styles slender. *Follicle* stout, curved, pointed, glabrous, ·6 in. long, red when ripe. Hook. fil. Fl. Br. Ind. II. 48.

Malacca; Griffith, No. 1265. Maingay, No. 501 (Kew Distrib.); Ridley, No. 1449. Singapore, Ridley, Nos. 2028, 3981. Perak; Wray, Nos. 1167, 3774.

5. ROUREA HUMILIS, Blume Mus. Bot. Lugd. Bat. I, 262. Scandent, woody, glabrous. *Leaves* 3·5 to 6 in. long, the rachises slender; leaflets 3 rarely 5, coriaceous, broadly ovate or ovate-orbicular, abruptly and obtusely caudate-acuminate, the base rounded, rarely sub-cuneate, upper surface very shining, the lower less so and more distinctly reticulate; main nerves about 4 pairs, spreading, faint; length 1·5 to 3 in., breadth 1 to 2·25 in. petiolules about ·2 in., the terminal leaflet the largest. *Racemes* axillary, clustered, slender, few-flowered; the buds sub-globose, on pedicels of about their own length. *Calyx-lobes* sub-orbicular, glabrous. *Stamens* shorter than the calyx, much shorter than the styles. *Follicles* cylindric, pointed, coriaceous, glabrous, ·75 in. long.

Nicobar Islands; Jelinek, No. 140. Kurz. Penang; Curtis, No. 2285. Pahang, Ridley, Nos. 2645, 5121; Singapore. Perak; King's Collector, No. 4677, Scortechini.—DISTRIB. Sumatra, Borneo.

Distinguished chiefly by its broadly ovate coriaceous leaves, very shining on the upper surface and with broad bases.

6. Rourea rugosa, Planch. in Linnaea XXIII, 422. A stout woody climber; young branches densely cinereous-tomentose. *Leaves* thinly coriaceous, 12 to 15 in. long, the rachises tomentose; leaflets 8 to 15 pairs, sub-sessile, sub-opposite, narrowly oblong or oblong-lanceolate, shortly and bluntly acuminate, rarely acute, the bases rounded or minutely cordate; upper surface glabrous, smoooth; the lower reticulate, sparsely pubescent, the midrib tomentose; main nerves 8 or 9 pairs, spreading, interarching very freely, prominent; length 2 to 3·25 in., breadth ·6 to 1·25 in. *Panicles* shorter than the leaves, crowded in the leaf-axils, pubescent, many-flowered. *Flowers* about ·2 in. long, their pedicels shorter. *Sepals* rotund, pubescent, half as long as the petals. *Follicle* about ·75 in. long, pointed, glabrous, striate. *Seed* ovoid, apiculate, about ·5 in. long. Hook. fil. Fl. Br. Ind. II, 46. *Connarus-rugosus*, Wall. Cat. 8527.

Singapore; Wallich. Malacca; Griffith, Maingay. Penang; Porter, Curtis. Perak; King's Collector, Wray.

7. Rourea parallela, Planch. in Linnaea XXIII, 421. A powerful woody climber often 150 feet long; young branches cinereous-pubescent. *Leaves* 2 to 6 in. long, their rachises with crisped pubescence; *leaflets* coriaceous, sessile, 10 to 22 pairs, opposite or sub-opposite, oblong, the apex broad, shortly bifid; the base minutely cordate, slightly oblique; upper surface glabrous, shining; the lower with very minute pale dots, sparsely pubescent especially on the midrib; main nerves about 6 pairs, faint; length ·5 to ·75 in., breadth ·25 to ·3 in. *Racemes* in axillary clusters, shorter than the leaves; the rachises slender, tomentose. *Flowers* not crowded, ·3 in. in diam. and ·2 in. long, the pedicels slightly shorter. *Sepals* puberulous, half as long as the petals, broadly oblanceolate, sub-glabrous. *Follicles* when ripe bright red with yellow tips, glabrous, ·6 to ·7 in. long, pointed. *Seed* elliptic, keeled on one side, ·3 in. long. *Under C. similis*, Bl. in Hook. fil. Fl. Br. Ind. II, 50. *Connarus mimusoides*, Vahl. ? Wall. Cat. 8526 C.

Penang; Porter; Curtis, No. 473. Malacca; Maingay, No. 498. Perak; King's Collector, Nos. 2580, 4302, 8405, 10119, 10592, 10896; Scortechini. Singapore; Anderson, Ridley. Kedah, Curtis, No. 2629.

Blume's species *R. similis* (Mus. Lugd. Bat. I, 264 (September, 1850), is stated by its author to be very near to this, and indeed Sir Joseph Hooker (Fl. Br. Ind. II, 50) has taken Blume's name in preference to Planchon's. *R. sororia*, Planch. from Borneo must, from the description, be also very near this.

Var. *major*. Flowers ·3 in. long and ·35 in. in diam. in lax panicles; leaflets nearly 1 in. long.

Perak; King's Collector, No. 5516.

8. ROUREA FULGENS, Planch. in Linnaea, XXIII, 423. A woody climber; young branches minutely and deciduously rusty-tomentose. *Leaves* 3 to 5 in. long, the rachis tomentose; leaflets 12 to 24 pairs, thinly coriaceous, oblong, slightly oblique, entire, obtuse, the base rounded or sub-cordate, usually oblique; upper surface glabrous, reticulate, minutely rugulose when dry, the lower rather densely covered with rusty silky pubescence; length ·4 to ·65 in., breadth ·15 to ·25 in. *Racemes* axillary, solitary, shorter than the leaves, pubescent, pedicels short. *Flowers* unknown. *Follicles* ·75 in. long, much curved. Hook. fil. Fl. Br. Ind. II, 46. *Connarus fulgens*, Wall. Cat. 8524.

Singapore; Wallich; Ridley, Nos. 2027, 4568. Malacca; Maingay, No. 499.

9. ROUREA CONCOLOR, Blume Mus. Bot. Lugd. Bat. I, 264. A woody climber; young branches rusty-pubescent. *Leaves* 1 to 4 in. long, the rachises tomentose; leaflets 4 to 16 pairs, thinly coriaceous, sub-sessile, broadly oblong, with very obtuse or truncate apex and broad oblique minutely cordate base; both surfaces glabrous, the upper shining, the lower minutely dotted and boldly reticulate; main nerves about 3 pairs, spreading; length 3·5 to 5 in., breadth 1·5 to 3 in. *Racemes* about as long as the leaves, axillary, slender, rusty-tomentose; pedicels slender, ·25 in. long, as long as the flowers. *Sepals* orbicular, only half as long as the oblong petals, stamens as long as the petals. *Follicles* ·5 to ·75 in. long, pointed. Hook. fil. Fl. Br. Ind. II, 49. *R. parvifolia*, Planch. in Linnaea, Vol. XXIII, 420. *Connarus mimusoides*, Wall. (not Vahl.) Cat. 8526 B. *Cnestis mimusoides*, Jack in Mal. Misc. Vol. II, VII, 44.

Singapore; Prince, Ridley, No. 2026, Hullett. Malacca; Griffith, No. 1262 (Kew Distrib.) Perak; King's Collector, No. 4373.—DISTRIB. Sumatra; Forbes, No. 3169. Borneo.

4. ROUREOPSIS, Planch.

Sarmentose or scandent shrubs. *Leaves* unequally-pinnate, leaflets few. *Flowers* in axillary racemes; pedicels slender, bracteolate at the base. *Sepals* oblong, slightly imbricate, somewhat enlarged and spreading, but not clasping the base of the capsule. *Petals* linear-oblong. *Stamens* 10, the alternate longer. *Ovaries* 5, styles slender. *Capsule* linear-oblong, straight. *Seed* ovoid; testa thin, black, arilliform at the base; cotyledons amygdaloid.—DISTRIB. Species 3, all Malayan.

This genus differs from *Rourea* in having straight (not curved) follicles, at the base of which the persistent sepals are free, and also in having bracteoles at the base of the pedicels.

Leaflets puberulous beneath	1.	*R. pubinervis.*
„ quite glabrous	2.	*R. Scortechinii.*

1. Roureopsis pubinervis. Planch. in Linnaea, XXIII, 424. A woody climber, sometimes as long as 50 feet; young branches with pale striate puberulous bark. *Leaves* 2·5 to 5 in. long, the rachises pubescent; leaflets membranous, 5 to 9, (the terminal one larger than the others), narrowly ovate-elliptic, tapering to each end, the apex abrupt and notched, the base cuneate; upper surface glabrous; the lower paler, puberulous on the midrib and sometimes on the nerves; main nerves 4 or 5, inter-arching, not much more prominent than the intermediate nerves; length of lateral leaflets ·7 to 1·7 in., breadth ·5 to ·75 in. *Racemes* slender, shorter than the leaves, solitary or in fascicles of 2 or 3 in the leaf axils, laxly few-flowered. *Flowers* ·35 in. long; their pedicels of about the same length, each with a minute pubescent persistent bracteole at its base. *Sepals* broadly oblong, obtuse, pilose near the apex, about half as long as the linear-oblong sub-acute glabrous petals. *Stamens* shorter than the sepals and pistils; ovaries pubescent. *Follicles* ovate, ·5 or ·6 in. long, not curved; the persistent calyx-lobes free, erect, about one-third as long as the fruit. Hook. fil. Fl. Br. Ind., II, 50. *Indeterminata*, Wall. Cat. 9050.

Penang; Porter; Curtis, 2332 and 2749. Malacca; Griffith, Maingay No. 500. Perak; very common, Scortechini, King's Collector.—Distrib. Java.

2. Roureopsis Scortechinii, King n. sp. A slender sarmentose woody shrub, all parts except the inflorescence glabrous, young branches minutely lenticellate *Leaves* 6 to 10 in. long, the rachis rather slender; leaflets 7 to 9, sub-opposite, very thinly coriaceous, ovate-lanceolate, tapering from below the middle to the long rather blunt acuminate point, the base cuneate; upper surface shining, the lower rather dull, paler and conspicuously reticulate; main nerves about 4 pairs, faint, the lower very oblique; length 2·25 to 3 in., breadth 1 to 1·25 in., petiolules about ·1 in., stout; the lowest leaflets the smallest. *Racemes* slender, axillary, 1 to 2 in. long, laxly-flowered, minutely and sparsely rusty-pubescent. *Flowers* about ·25 in. long, on slender pedicels about ·2 in. long, each pedicel with a minute rusty-tomentose bracteole at its base. *Calyx-lobes* ovate, obtuse, ciliolate, hairy inside, glabrous outside. *Petals* longer than the calyx, lanceolate, plicate in bud, yellowish. *Filaments* slightly coherent at the base, glabrous. *Pistils* 5, only 1 or 2 fertile. *Fruit* narrowly ovoid, not curved, pointed, coriaceous, glabrous, 1 in. long.

Perak; Scortechini, No. 613. Curtis (elevation 5,000 feet), No. 1998.

Scortechini's specimens have flowers in bud only, and none of them is in fruit. The foregoing description, as respects the flower, is copied from his field note. The fruit is described from what I take to be the same plant collected by Curtis in Perak at an elevation of 5,000 feet and described by him as a small tree.

5. Agelæa, Soland.

Erect or scandent shrubs. *Leaves* 3-rarely 5-foliolate. *Panicles* or *racemes* axillary. *Calyx* 5-partite, not accrescent nor embracing the fruit, imbricate or subvalvate. *Petals* lanceolate or ligulate, obtuse, free or connate at the middle. *Stamens* 5 or 10. *Disc* ½-annular or 0. *Pistils* 2–5. *Follicles* 1–3, sessile or shortly stalked, coriaceous, rugose or lamellate. *Seed* erect, exalbuminous; testa arilliform below the middle. —Distrib. 12 species, African and Asiatic.

Main nerves of leaflets 2 or 3 pairs, sub-erect, curving.
- All parts more or less pubescent, stamens 5 ... ... 1. *A. vestita.*
- All parts, except the inflorescence, glabrous; stamens 10 ... 2. *A. Wallichii.*

Main nerves of leaflets 7 to 10 pairs, spreading.
- Leaflets 3 to 5, all parts more or less pubescent; stamens 5 .. 3. *A. pinnata.*
- Leaflets never more than 3, adult leaves quite glabrous; stamens 10 ... ... 4. *A. Hullettii.*

1. Agelæa vestita, Hook. fil. Fl. Br. Ind. II, 46. A rather slender woody creeper 20 to 80 feet long; young branches at first rusty-tomentose but soon becoming sub-glabrous or glabrous. *Leaflets* membranous, unequal, more or less ovate or elliptic, with rounded base and caudate-acuminate apex; the terminal one the larger, sometimes ovate-rotund to sub-rhomboidal; its petiolule ·5 or more in length, swollen at the apex; the lateral leaflets inequilateral, the petiolule only ·1 or ·2 in. long; upper surface of all sparsely adpressed-pubescent, the midrib and nerves tomentose; lower surface pubescent; main nerves about 3 pairs (one pair sub-marginal), much curved, prominent as are the intermediate nerves and reticulations; length of the lateral leaflets 2·5 to 3 in., breadth 1·25 to 1·75 in., the terminal one larger. *Panicles* extra-arillary, less than 1 in. long, tomentose, with many short branches. *Flowers* under ·2 in. long, on slender pedicels. *Calyx* cleft to the very base; the segments unequal, linear, tomentose, shorter than the glabrous yellowish oblanceolate or linear petals. *Stamens* 5, unequal. *Styles* 2 to 5, slender, with a few white hairs. *Follicles* solitary, bright red, rarely in pairs, ovoid, boldly tuberculate or lamellate externally and tomentose, about ·6 to ·8 in. long, usually with a short curved stout apical beak. *Seed* narrowly sub-obovoid, black, ·4 in. long, pale and arilliform near the base. *Cnestis vestita*, Wall. in Herb. Linn. Soc. *Connaracea*, Wall. Cat. 8535. *Hemiandrina borneensis*, Hook. f. in. Trans. Linn. Soc. xxxiii. 171, t. 28. *Troostwyckia singularis*, Miq. Fl. Ind. Bat. Suppl. 531.

Singapore; Jack, Ridley. Penang; Porter, Curtis. Malacca; Griffith, Maingay. Perak; King's Collector, Scortechini, Johore, Ridley.—Distrib. Sumatra, Borneo.

A very common species in Perak. The arillus of the seed is very inconspicuous

in dried specimens. The number of the pistils varies from 2 to 5. There are in the Kew Herbarium fruiting specimens of a plant collected by Griffith which exactly resembles this except that its fruits (which are immature) are non-tuberculate and are covered with a dense coating of long silky tawny hairs. The same plant was collected by the Calcutta Garden Collector (No. 6878), but also without flowers. I believe the dense hairiness of the fruit of both gatherings to be due to the irritation caused by the deposit of the eggs of some insect in the young fruit.

2. Agelæa Wallichii, Hook. fil. Fl. Br. Ind. II, 47. A slender woody creeper 20 to 50 feet long, all parts except the inflorescence glabrous. *Leaflets* coriaceous, slightly unequal, ovate-elliptic, with rounded or cuneate bases and short caudate-acuminate apices; the petiolule of the terminal leaflet about 1 in. long, thickened near the apex; the petiolules of the lateral leaflets about ·25 in. long; both surfaces shining, the lower reticulate; length 3 to 4·5 in.; breadth 1·5 to 2·25 in.; main nerves 2 or 3 pairs, ascending, much curved, one pair submarginal. *Panicles* under 1 in. long, extra-axillary, pubescent. *Flowers* ·25 in. in diam., on pedicels longer than themselves. *Calyx* divided for three-fourths of its length into 5 ovate-lanceolate imbricate segments, sparsely pubescent externally, glabrous internally, their edges densely sericeous. *Petals* longer and narrower than the segments of the calyx, glabrous, linear, sub-acute. *Stamens* 10, sub-equal, longer than the styles, much shorter than the petals. *Pistils* 5, very short, stout. *Follicle* usually solitary, bright red when ripe, ovoid, curved, shortly beaked, covered outside with short obtuse tubercles and minutely rusty-tomentose, inside glabrous, ·6 in. long. *Seed* oblong, black, its lower half pale and arilliform. *Connaracea*, Wall. Cat., 8544.

Singapore; Wallich. Malacca; Griffith (Kew Distrib.) No. 1275, Maingay, No. 511, Derry, No. 69. Penang; Curtis, Nos. 1633 and 3032. Perak; Wray, No. 48, Scortechini, No. 1730, King's Collector, No. 3735. —Distrib. Sumatra, Forbes, No. 2589.

3. Agelæa pinnata, King n. spec. A woody climber 30 to 40 feet long; young branches rusty-puberulous, striate. *Leaflets* 3 to 5, thinly coriaceous, unequal, (the middle the largest), elliptic, broadly and shortly caudate-acuminate, the base rounded or sub-cuneate; upper surface glabrous except the minutely pubescent midrib; lower surface minutely sub-adpressed pubescent, the transverse veins distinct; the midrib tomentose; main nerves 7 to 10 pairs, spreading and curving upwards, prominent on the lower surface, slightly impressed on the upper; length of the terminal leaflet 6 to 8 in., breadth 3 to 3·5 in.; its petiolule jointed to the rachis and not longer than those of the lateral slightly smaller leaflets. *Panicles* about 1 in. long, densely crowded in the axils of the leaves, many-flowered, minutely tomentose. *Flowers* ·3 in. long, their pedicels half as long. *Calyx* divided to the very base

into 5 linear acuminate reflexed segments, half as long as the petals, tomentose externally. *Petals* linear, much acuminate, glabrous, white inside and purple outside. *Stamens* 5, shorter than the pistils, the anthers sub-globular. *Pistils* 5, the ovaries softly tomentose; the styles spreading, recurved; the stigma bifid. *Fruit* unknown.

Perak; King's Collector, No. 5425.

This differs notably from both the other species of this genus in its leaflets having often 5 instead of 3 leaflets. In the structure of its flowers, however, it agrees perfectly with the diagnosis of the genus. It is more nearly allied to *A. vestita* than to *A. Wallichii*, but it differs from both in the larger number of main nerves in its leaves. Its flowers are moreover larger than these of *A. vestita*, and the petals are differently coloured.

4. Agelæa Hullettii, King n. spec. A woody creeper 15 to 20 feet long; young branches minutely tomentose. *Leaflets* 3, coriaceous; the terminal slightly the largest, narrowly elliptic-oblong; the lateral pair slightly oblique, all with acute apices and cuneate bases; the petiolule of the terminal one from ·5 to ·75 in. long, jointed; those of the lateral pair ·25 in. long; upper surface glabrous and minutely pitted, the lower finely reticulate, when young sub-lepidote and puberulous, when adult glabrous; main nerves 7 or 8 pairs, spreading and curving upwards, prominent on the lower and obsolete on the upper surface; some of the intermediate nearly as distinct; length of the terminal leaflet 6 to 9 in., breadth 2 to 2·5 in., the lateral pair rather smaller. *Panicles* less than 1 in. long, minutely tomentose, crowded in the leaf-axils or from the axils of fallen leaves, many-flowered. *Flowers* ·2 in. long and about the same across; their pedicels about ·25 in. long. *Calyx* divided for two-thirds of its length into 5 lanceolate segments, tomentose outside, glabrescent inside. *Petals* longer than the sepals, spreading, linear-oblong, glabrous, with a mesial rib, recurved from about the middle. *Stamens* 10, the alternate ones shorter, none of them so long as the pistils. *Ovaries* narrowly oblong, tomentose. *Styles* sub-glabrous, slightly diverging. *Follicles* 1 to 3, bright red when ripe, woody, ovoid, shortly beaked, externally tubercled and minutely rusty-tomentose, inside glabrous, length ·5 to ·65 in. *Seed* sub-cylindric, compressed, the upper half black, the lower pale and arilliform, ·5 in. long.

Singapore; Hullett, No. 841; Ridley, No. 4589. Perak; King's Collector, No. 5729.

This is distinguished from *A. pinnata* by the leaflets being invariably 3 and the stamens being only 5 while, in that species, there are often 5 leaflets and always 10 stamens. This resembles *A. Wallichii* in some respects, but it differs from that species in having larger leaflets more cuneate at the base with acute, not caudate-acuminate, apices and with more than twice as many main nerves. The leaflets of the former are moreover quite glabrous at all stages, while in this the lower surface of the young leaflets is puberulous and lepidote.

NOTE.

Connarus Diepenhorstii, Miq. Fl. Ind. Bat. Suppl. 529, (of which a type specimen is in the Calcutta Herbarium) is unmistakeably a species of *Agelæa* and should be named *Agelæa Diepenhorstii*. It is allied to *A. Wallichii*, Hook. fil., but has larger leaflets and much longer racemes. To this belong Teysmann's Sumatra specimens from Prianam (Herb. Hort. Bogor., No. 2197), and Forbes's from the Lampongs in Sumatra, Nos. 1313 and 1386.

6. TÆNIOCHLÆNA, Hook. f.

A rambling shrub. *Leaves* unequally pinnate, glabrous; leaflets 3, quite entire. *Panicles* axillary, short. *Flowers* hermaphrodite. *Calyx-tube* short, hemispheric; segments 5, enlarged and revolute in fruit, valvate. *Petals* 5, much exceeding the calyx. *Stamens* 10, alternately shorter, nearly free at the base. *Ovaries* 5, sessile; styles short, stigmas discoid. *Follicles* 1–3, ovoid, pubescent; valves glabrous within. *Seed* oblong, arillate; albumen 0, cotyledons plano-convex.

TÆNIOCHLÆNA GRIFFITHII, Hook. fil. in Benth. and Hook. Gen. Pl. I, 434; Fl. Br. Ind. II, 55. Young branches puberulous, and with pale brown lenticels; all parts except the inflorescence quite glabrous. *Leaflets* coriaceous, the terminal largest, elliptic to ovate-elliptic, with sub-acute slightly bifid apices, slightly narrowed to the rounded base, the edges slightly sub-revolute when dry; both surfaces shining, the lower reticulate; main nerves 4 or 5 pairs, the lower pair sub-marginal, all curved upwards, prominent on the lower and depressed on the upper surface; the petiolules of all jointed, ·15 in. long; length of the terminal leaflets 5 to 6·5 in., the laterals smaller. *Panicles* (fide Sir J. D. Hooker) "2 to 3 in. long, fascicled, densely pubescent, slender. *Flowers* rotate, ·33 in. in diam. *Segments of the calyx* oblong, pubescent, recurved in flower. *Petals* twice as long, linear, dilated upwards, glabrous; filaments short, subulate. *Follicles* 2 or 3, ·5 to 1 in. long, obtuse, densely pubescent, valves coriaceous. *Seed* short, slightly compressed, testa black, arillus small."

Malacca; Griffith, Maingay, No. 497.

7. CNESTIS, Juss.

Scandent shrubs or trees. *Leaves* unequally pinnate; leaflets many, quite entire. *Flowers* in racemes, tomentose, rarely panicled, polygamous or dicœcious, rotate. *Sepals* 5, valvate or imbricate at the tip, spreading in fruit. *Petals* 5, shorter or longer than the calyx. *Stamens* 10, free. *Ovaries* 5–7, sessile; styles short, stigmas capitellate. *Capsules* 1–3, kidney-shaped, cylindric, curved or waved, pubescent, often villous or clothed with rigid hairs within. *Seed* with a thin arillus, albumen

fleshy, cotyledons thin.—DISTRIB. Tropical Asia and Africa; species about 17.

CNESTIS RAMIFLORA, Griff. Notul. IV, 432. A small tree or a climber, young branches, rachises of leaves, under surfaces of leaflets and inflorescence more or less softly rusty-tomentose. *Leaves* 8 to 15 in. long; leaflets 19 to 31, sub-sessile, narrowly oblong, rarely slightly obovate, obtuse or sub-acute; the base broad, rounded or minutely cordate; upper surface sparsely adpressed-pubescent or glabrescent, the nerves pubescent; main nerves 4 or 5 pairs, spreading, faint; length 1·25 to 3 in., breadth ·4 to 1·5 in. *Racemes* much shorter than the leaves, in axillary fascicles. *Female flowers* about ·35 in. in diam., the males smaller. *Sepals* narrowly oblong, obtuse, pubescent on both surfaces. *Petals* similar in shape to the sepals but sometimes longer, glabrous. *Stamens* much shorter than the sepals, the filaments glabrous. *Disc* and *Ovaries* 5, tomentose, styles short. *Follicles* 1 to 3 from one flower, sessile, compressed, falcate, widest about the middle, much curved, rugose, rusty-pubescent; the pericarp very thick, woody, lined inside with a dense layer of sericeous tomentum, 1·5 to 1·75 in. long and ·8 in. broad. *Seed* broad, compressed, the testa and arillus thin. Kurz Journ. As. Soc. Beng. Vol. XLV, pt. 2, p. 216; For. Flora Burma, I, 329; Hook. fil. Fl. Br. Ind. II, 54. *C. flaminea*, Griff. Notul. VI, 433. *C. platantha*, Griff. l. c. 434; Kurz l. c. *Cnestis foliosus* and *C. igneus*, Planch. MSS. in Herb. Kew. *Connarus foliosus*, Jack in Wall. Cat. 8529. *C. igneus*, Wall. Cat. 8528. *Rourea dasyphylla*, Miq. Fl. Ind. Bat. Suppl. 528.

In all the provinces, a common plant.—DISTRIB. Burma, Sumatra, Philippine Islands.

A widely distributed plant and therefore presenting various forms, some of which (as the synonymy shows) have been regarded as species. The form which is most distinct is that which assumes the habit of a small tree; but its flowers and leaves are in no way different from those of the scandent forms. This was, however, kept separate by Kurz under the specific name *C. ramiflora* Griff.; while, for the scandent forms, he kept the name *C. platantha*, Griff.

ORDER XXXVIII. LEGUMINOSÆ.

(BY D. PRAIN.)

Herbs, shrubs or trees. *Leaves* stipulate and usually alternate, pinnate or digitate or simple, often stipellate, sometimes with the rachis ending in a bristle or tendril. *Inflorescence* axillary or leaf-opposed or terminal; usually simply racemose or panicled; bracts and bracteoles usually both present. *Flowers* usually irregular, hermaphrodite, rarely regular or polygamous. *Sepals* 5, combined or free, often unequal, sometimes arranged in two lips. *Petals* 5, rarely fewer by arrest, very

rarely 0, usually free and unequal. *Stamens* normally 10, perigynous or almost hypogynous, rarely fewer by arrest, or indefinite; filaments free or variously combined; anthers 2-celled, dehiscence almost always longitudinal. *Ovary* free, style simple, cylindric, usually declinate; stigma capitate, terminal or oblique; ovules 1–∞ on the ventral suture. *Fruit* usually dry, a pod splitting open along both sutures, sometimes opening only along the ventral suture, sometimes continuous and indehiscent, sometimes separating into one-seeded indehiscent segments. *Seeds* usually exalbuminous; cotyledons foliaceous or amygdaloid, with a straight or an inflexed accumbent radicle.

A very large order with three very natural suborders, including altogether about 8,000 species. Of these suborders the *Papilionaceæ* are cosmopolitan in distribution, the *Cæsalpinieæ* and the *Mimoseæ* are confined to the tropics and to warm temperate regions.

Petals imbricate :—
Calyx segments united above the level of the disc; the upper petal (standard) exterior (PAPILIONACEÆ) :—
Stamens mon- or diadelphous :—
Pods dehiscent along both sutures :—
Leaves even-pinnate the rachis continued as a tendril or bristle .. .. I. VICIEÆ.
Leaves simple, digitate or odd-pinnate :—
Leaves simple *sessile*, or digitately 3–7-foliolate; stamens monadelphous, anthers dimorphous ... ... II. GENISTEÆ.
Leaves pinnately 3-foliolate, rarely (*Clitoria*) 5–7-foliolate or (*Flemingia*) *petioled* 1-foliolate or digitately 3-foliolate and then with 2-adelphous stamens; when stamens 1-adelphous, the upper filament attached to the others at its base ... ... III. PHASEOLEÆ.
Leaves 5–∞-foliolate, or if 1–3-foliolate (*Tephrosia*) with partially monadelphous stamens and uniform anthers, or (*Indigofera*) with 2-adelphous stamens, apiculate anthers and basifixed hairs; when stamens monadelphous the upper stamen free at its base ... IV. GALEGEÆ.
Pods indehiscent or opening along lower suture; (leaves, except *Arachis* and *Smithia*, odd-pinnate) :—
Pods not segmented, always quite indehiscent; leaves all odd-pinnate ... ... V. DALBERGIEÆ.
Pods breaking into 1-seeded indehiscent segments, or if dehiscent (*Desmodium* in part) only opening along lower suture; if not segmented (*Arachis*) with leaves even-pinnate; (segment solitary in *Phylacium*) ... ... VI. HEDYSAREÆ.
Stamens free .... VII. SOPHOREÆ.

Calyx segments free to the level of the disc (except *Bauhinieæ*); the upper petal interior (CÆSALPINIEÆ):—
Leaves simple or simply pinnate:—
Anthers basifixed ... ... VIII. CASSIEÆ.
Anthers versatile:—
Petals 5:—
Calyx gamosepalous or valvately partite ... IX. BAUHINIEÆ.
Calyx lobes free imbricate ... ... X. CYNOMETREÆ.
Petals fewer than 5 (3 or 1 or 0) ... ... XI. AMHERSTIEÆ.
Leaves 2-pinnate ... ... XII. CÆSALPINIEÆ.
Petals valvate (MIMOSEÆ):—
Calyx teeth imbricated ... ... XIII. PARKIEÆ.
Calyx valvate:—
Stamens 5 or 10:—
Anthers glandular ... ... XIV. ADENANTHEREÆ.
Anthers not glandular ... ... XV. EUMIMOSEÆ.
Stamens ∞:—
Filaments free ... ... XVI. ACACIEÆ.
Filaments united ... ... XVII. INGEÆ.

A. *SUBORDER I. PAPILIONACEÆ. Calyx segments united beyond the disc. Petals imbricated, the upper external. Radicle inflexed accumbent or, rarely, very short and straight.*

TRIBE I. VICIEÆ. Dwarf herbs or climbers. *Leaves* usually even-pinnate, the petiole produced in a spine or tendril, leaflets entire ex-stipellate; stipules often foliaceous. *Flowers* solitary or racemose. *Stamens* diadelphous (9+1). *Pod* dehiscent.

1. Abrus.

TRIBE II. GENISTEÆ. Shrubs, sometimes tree-like, or non-climbing herbs. *Leaves* simple or digitately 3–∞-foliolate, rarely 1-foliolate; stipules small, free. *Flowers* in racemes or spikes. *Stamens* monadelphous: anthers almost always 2-morphous. *Pod* dehiscent.

2. Crotalaria.

TRIBE III. PHASEOLEÆ. Climbing or creeping herbs, rarely erect and shrubby, very rarely trees. *Leaves* pinnately 3-foliolate, rarely 1- or 5–7-foliolate, leaflets entire or lobed, almost always stipellate. Bracts 2 opposite persistent stipular or caducous. *Stamens* monadelphous, but if so the upper filament always free at the base; or diadelphous (9+1) by more or less complete detachment of the upper; anthers uniform very rarely (*Mucuna*) 2-morphous. *Pod* dehiscent.

Leaves gland-dotted beneath ... ... *A. Cajaneæ.*
Leaves not gland-dotted beneath:—
Style bearded and bracts very small or deciduous ... *B. Euphaseoleæ.*
Style beardless, or if bearded (*Clitoria*) with bracts persistent:—
Rachis of inflorescence not swollen at nodes (style bearded in *Clitoria*) ... ... *C. Glycineæ.*

Rachis of inflorescence nodose :—
Upper stamen subconnate with the others and petals subequal ... ... *D. Diocleæ.*
Upper stamen free or if subconnate, then petals very unequal :—
Petals very unequal ... ... *E. Erythrineæ.*
Petals of same length ... ... *F. Galactieæ.*

Sub-tribe A. Cajaneæ. Inflorescence racemose, rachis not swollen, or flowers subumbellate or solitary, bracts usually membranous caducous, bracteoles 0; petals of subequal length; upper stamen free; style bearded, stigma terminal; leaves gland-dotted at least beneath; stipels small, sometimes 0.

3. Flemingia. *Ovules* 2; *pod turgid, leaves subdigitate or* 1*-foliolate.*
4. Eriosema. *Ovules* 2; *pod compressed, leaves pinnately* 3*-foliolate; funicle terminal on hilum.*
5. Dunbaria. *Ovules* 4–∞ ; *pod compressed, not deep-lineate between the seeds.*
6. Atylosia. *Ovules* 4–∞ ; *pod compressed, deep-lineate between the strophiolate seeds.*
7. Cajanus. *Ovules* 4–∞ ; *pod compressed, deep-lineate between the seeds; strophiole* 0.

Sub-tribe B. Euphaseoleæ. Inflorescence racemose, rachis nodose, bracts small or caducous; petals equal in length or the keel long-beaked, or spirally twisted; upper stamen free; style longitudinally bearded along the inner face or less often simply pilose round the stigma.

8. Phaseolus. *Keel spiral.*
9. Vigna. *Keel not spiral; stigma oblique, style not flattened upwards; pods not lineate between seeds.*
10. Pachyrhizus. *Keel not spiral; stigma oblique globose on inner face of style flattened upwards; pod lineate.*
11. Dolichos. *Keel not spiral; stigma terminal; pod not winged.*
12. Psophocarpus. *Keel not spiral; stigma terminal; pod square, winged at the* 4 *corners.*

Sub-tribe C. Glycineæ. Inflorescence of axillary fascicles or racemes of solitary or geminate flowers on an unswollen rachis; standard not appendiculate or (in small flowered genera) minutely appendiculate at the base; upper stamen free or united at the base with the rest; style naked (bearded in *Clitoria*).

13. Clitoria. *Bracts persistent; standard large not spurred; calyx-tube long; style bearded; stamens* 10 *fertile.*
14. Centrosema. *Bracts persistent; standard large spurred on the back; calyx-tube short; style naked; stamens* 10 *fertile.*
15. Teramnus. *Bracts small decidous; standard small; stamens alternate,* 5 *fertile,* 5 *sterile.*

Sub-tribe D. Diocleæ. Inflorescence racemose with rachis swollen at the nodes, bracts small or caducous; calyx usually 4-lobed from union of the two upper teeth, rarely very unequally 2-lipped; petals subequal in length; upper stamen free at the base, connate with the remainder above; style not bearded.

16. Dioclea. *Calyx campanulate; pod broad much thickened along upper suture.*
17. Pueraria. *Calyx campanulate; pod linear, flat or narrow.*
18. Canavalia. *Calyx 2-lipped; with a large upper and small lower lip.*

Sub-tribe E. Erythrineæ. Inflorescence usually racemose with rachis nodose, flowers showy with unequal petals—in some genera with very large standard longer than the wings and sometimes than the keel also, in others with standard much exceeded by the large cochleate keel; upper stamen free or united at the base with the remainder; style naked; bracts usually small, deciduous.

19. Mucuna. *Keel longest, standard shorter than wings; anthers 2-morphous; climbers.*
20. Strongylodon. *Standard and keel equal and longer than wings; anthers uniform; climbers.*
21. Erythrina. *Standard longer than keel and wings; anthers uniform; armed trees.* Pod sometimes dehiscent only at apex, sterile and indehiscent below.

Sub-tribe F. Galactieæ. Inflorescence racemose with nodose rachis, more rarely amply paniculate; bracts small very deciduous; calyx usually 4-lobed, the two upper teeth connate; petals sub-equal in length; upper stamen free; style not bearded.

22. Spatholobus. Pod 1-seeded at the apex only and there partially dehiscent, sterile and indehiscent below.

Tribe IV. Galegeæ. Herbs never twining, erect shrubs, or less often trees or large woody climbers. *Leaves* odd-, very rarely even-pinnate without the rachis prolonged, leaflets ∞, or rarely 3–1, usually entire. *Stamens* 10, the lower 9 united as far as their middle or further in a sheath split along the upper side or less often closed in the middle, the upper sometimes free from the base, at others connate *by its middle* with the sheath, very rarely wanting; filaments filiform at the tips, anthers versatile uniform, or rarely somewhat dimorphous. *Pod* not segmented, 2-valved or if indehiscent usually small, 1–2-seeded or membranous inflated. *Seeds* rarely strophiolate.

Anthers with connective apiculate or gland-tipped ... ... *A. Indigofereæ.*
Anthers muticous:—
Racemes all axillary or from old nodes ... ... *B. Robinieæ.*

Racemes terminal, or leaf-opposed, or paniculate at the ends of branches	*C. Tephrosieæ.*

Sub-tribe A. Indigofereæ. Herbs or shrubs, glandular punctate or not, usually hoary canescent, the hairs always fixed in the middle; racemes or spikes axillary; connective of anther produced in a gland or mucro; ovules usually ∞ ; pod 2-valved.

23. Indigofera.

Sub-tribe B. Robinieæ. Herbs, erect or rarely climbing shrubs, or trees; racemes all axillary or fasciculate on old nodes; upper stamen usually free; anthers muticous; ovules ∞ ; style usually rigid; pod usually 2-valved, flat or only turgid opposite the seeds.

24. Sesbania.

Sub-tribe C. Tephrosieæ. Herbs, erect or large climbing shrubs, or trees; racemes terminal or leaf-opposed or panicled at the ends of branches, rarely arising from upper axils, or with the lower or all the pedicels geminate or fasciculate in the axils of leaves; authers muticous; ovules usually ∞ ; style usually rigid; pod 2-valved.

25. Tephrosia. *Leaves striate-veined; pod thin, early dehiscent.*

26. Millettia. *Leaves reticulate-veined; pod firm, tardily dehiscent.*

Tribe V. Dalbergieæ. Trees or erect or lofty climbing shrubs. *Leaves* pinnately 5–∞-foliolate, very rarely 3- or 1-foliolate, usually exstipellate. *Inflorescence* various, paniculate, fascicled racemose, or cymose. *Stamens* all united in one sheath, entire or split along the upper side, or in two lateral half-sheaths from simultaneous fission along both upper and lower sides, or the upper stamen free the rest connate; anthers usually uniform. *Pod* longer than the calyx, membranous, coriaceous, woody or drupaceous, indehiscent and not segmented.

Leaflets opposite	*A. Lonchocarpeæ.*
Leaflets alternate	*B. Pterocarpeæ.*

Sub-tribe A. Lonchocarpeæ. Leaflets opposite; pod not drupaceous; seeds usually transverse or attached by a lateral hilum, not pendulous.

27. Pongamia. *Pod coriaceous, not winged; calyx subtruncate.*

28. Derris. *Pod coriaceous or membranous, winged; calyx subtruncate.*

29. Kunstleria. *Pod membranous not winged; calyx toothed.*

Sub-tribe B. Pterocarpeæ. Leaflets alternate; pod not drupaceous; seeds usually transverse or attached by a lateral hilum, not pendulous.

30. Dalbergia. *Anthers small, terminal; pod oblong or linear.*

31. Pterocarpus. *Anthers versatile; pod suborbicular.*

Tribe VI. Hedysareæ. Herbs, undershrubs or shrubs sometimes twining or climbing, rarely trees. *Leaves* odd- or rarely even-pinnate, petiole if produced not cirrhate, leaflets 3–∞, rarely digitately 3–4-foliolate, 1-foliolate or simple. *Stamens* diadelphous, 9 connate in a sheath as high as their middle or higher and split along the upper side, the upper being free, or monadelphous in a sheath split along the upper side, or diadelphous in two equal lateral half-sheaths (split simultaneously along upper and lower sides) or rarely all free; filaments free at their tips, filiform or dilated upwards; anthers uniform versatile, or rarely 2-morphous, the alternate larger subbasifixed. *Pod* indehiscent separating into 1-seeded segments, rarely unsegmented (*Arachis*), or by abortion or organically (*Phylacium*) 1-seeded. *Seeds* rarely strophiolate.

Stamens monadelphous, anthers 2-morphous; leaflets even-pinnate or digitate, exstipellate ... ... *A. Stylosantheæ.*
Stamens diadelphous, anthers uniform; leaflets odd-pinnate or simple.
Leaflets exstipellate, staminal phalanges 5+5 ... ... *B. Aeschynomeneæ.*
Leaflets stipellate, staminal phalanges 9+1 ... ... *C. Desmodieæ.*

Sub-tribe A. Stylosantheæ. Herbaceous approaching undershrubs, often viscid; leaves exstipellate, leaflets few; flowers spicate, capitate or rarely subracemose, in terminal spikes, or axillary by suppression of floral branches; bracts 1-foliolate and 2-stipulate, or stipuloid from suppression of the leaf-element; stamens monadelphous; anthers 5 oblong basifixed, 5 alternate shorter versatile.

32. Arachis. *Calyx-tube long filiform; leaves even-pinnate;* pod not segmented ripening underground.

33. Zornia. *Calyx-tube not elongated; leaves digitately* 2–4-*foliolate.*

Sub-tribe B. Aeschynomeneæ. Herbs, undershrubs or shrubs; leaves pinnate, leaflets ∞, or rarely 1–3, exstipellate; flowers usually in few-fld. axillary racemes, rarely in axillary fascicles or subcymose; keel obtuse or beaked, incurved; wings usually transversely folded; stamens (*in Malayan genera*) connate in two lateral phalanges; style filiform.

34. Smithia. *Pod folded within calyx.*

35. Ormocarpum. *Pod straight exserted, joints oblong; ovary sessile.*

36. Aeschynomene. *Pod straight exserted, joints quadrate or suborbicular; ovary stipitate.*

Sub-tribe C. Desmodieæ. Herbs, rarely twining, or undershrubs, less often shrubs, very rarely trees; leaves pinnately 3-foliolate or 1-foliolate the distal leaflets 2-stipellate the lateral leaflets opposite, each 1-stipellate, rarely 5–7-foliolate; stipules often striate; flowers in pairs

along the rachis of a raceme, rarely fasciculate or solitary, the racemes terminal or casually at the same time also axillary; standard usually cuneate at the base, wings as long as or longer than keel and usually adherent to its base; upper stamen free or coherent with the rest from the base upwards; pod sometimes (*Phylacium*) 1-jointed, sometimes (*Desmodium* § *Nicholsonia*) opening along the lower suture.

37. Phylacium. *Ovary* 1-*ovuled*; *pod* 1-*seeded.*
38. Uraria. *Ovary* 2- *or more-ovuled*; *pod folded inside calyx*; *calyx-tube short, teeth long, not accrescent.*
39. Lourea. *Ovary* 2- *or more-ovuled*; *pod folded inside calyx*; *calyx-tube large, teeth small, accrescent in fruit.*
40. Alysicarpus. *Ovary* 2- *or more-ovuled*; *pod straight exserted*; *joints of pod coriaceous as thick as they are long and broad.*
41. Desmodium. *Ovary* 2- *or more-ovuled*; *pod straight exserted*; *joints of pod membranous or, if coriaceous* (§ Dendrolobium), *broader than their thickness, and, if as thick as they are broad,* (§ Scorpiurus) *then much longer than broad.*

Tribe VII. Sophoreæ. Trees or tall shrubs, very rarely subherbaceous or large climbers. *Leaves* pinnately 5–∞-foliolate or 1-foliolate. *Corolla* papilionaceous or almost regular the upper petal outer in bud, the lower ones occasionally absent. *Stamens* 10, free or very slightly connate at the base. *Pod* indehiscent unsegmented, or 2-valved. *Radicle* straight, incurved or inflexed.

42. Sophora. *Pod moniliform elongated, indehiscent.*
43. Ormosia. *Pod short thickly coriaceous, 2-valved.*

B. *Suborder II. Cæsalpinieæ. Calyx-segments partite to the disc, very rarely* (*some* Bauhinias) *gamosepalous. Petals imbricated the uppermost internal. Radicle straight or, rarely, slightly oblique. Stamens almost always free.*

Tribe VIII. Cassieæ. Trees, rarely shrubs or undershrubs. *Leaves* odd- or even-pinnate. *Calyx* segments or sepals 5, rarely 4–3, divided to the disc, imbricate or rarely subvalvate. *Petals* 5 or fewer or 0. *Anthers* erect, thick, basifixed, dehiscence longitudinal or 2-porose; or rarely dorsifixed and 2-porose. *Ovary* or stipe free inside calyx-tube. *Ovules* 2—∞, rarely 1. *Seeds* albuminous.

44. Cassia. *Sepals* 5, *petals* 5; *stamens* 10 *or* 5, *leaves even-pinnate.*
45. Koompassia. *Sepals* 5, *petals* 5; *stamens* 5; *leaves odd-pinnate.*
46. Dialium. *Sepals* 5, *petals* 2 *or* 1 *or* 0, *stamens* 2; *leaves odd-pinnate.*

Tribe IX. Bauhinieæ. Woody tendril-bearing climbers, rarely trees. *Leaves* simple, entire or 2-lobed; rarely 2-foliolate. *Calyx* gamo-

sepalous above the disc or valvately partite, the tip 5-toothed or less often 5-lobed with teeth or lobes imbricated. *Petals* 5. *Anthers* versatile. *Ovary* with stalk free or adnate to calyx-tube. *Ovules* 2–∞. *Seeds* albuminous.

47. Bauhinia.

Tribe X. Cynometreæ. Trees. *Leaves* even-pinnate, 2–∞-foliolate. *Calyx* lobes divided to the disc, imbricate or valvate. *Petals* 5 or fewer or 0. *Anthers* versatile. *Ovary* 1–2-ovuled. *Flowers* usually small.

48. Cynometra.

Tribe XI. Amherstieæ. Trees. *Leaves* even-, very rarely odd-pinnate, 2–∞-, rarely 1-foliolate. *Calyx* lobes divided to the disc, imbricate, very rarely valvate. Petals 5 or fewer or 0. *Anthers* versatile. *Ovary* 3–∞-ovuled, stalk adnate to the disc-bearing tube of calyx.

49. Tamarindus. *Petals* 3 *perfect; stamens* 3 *perfect.*
50. Sindora. *Petal* 1; *leaves very coriaceous; calyx-segments subvalvate.*
51. Afzelia. *Petal* 1; *leaves papery; calyx-segments much imbricated.*
52. Saraca. *Petals* 0; *leaflets even-pinnate.*
53. Crudia, *Petals* 0; *leaflets alternate odd-pinnate.*

Tribe XII. Eucæsalpinieæ. Trees, shrubs or large climbers. *Leaves* all 2-pinnate or, rarely, some leaves simply pinnate others 2-pinnate. *Calyx* lobes divided to the disc. *Petals* usually 5 slightly unequal. *Anthers* versatile. *Ovary* 2–∞-, rarely 1-ovuled, the stalk free in the calyx tube.

54. Peltophorum. *Calyx-lobes subequal; pod winged along both sutures;* stigma large peltate.
55. Cæsalpinia. *Calyx-lobes unequal, the lowest large hooded; pod wingless.*
56. Mezoneuron. *Calyx-lobes unequal, the lowest large hooded; pod winged along upper suture.*
57. Pterolobium. *Calyx-lobes unequal, the lowest large hooded; pod samaroid, winged at the apex only.*

C. *Suborder III. Mimoseæ. Flowers regular small. Calyx gamosepalous or valvately partite. Petals valvate, usually connate below the middle. Stamens free or monadelphous.*

Tribe XIII. Parkieæ. Trees. *Leaves* 2-pinnate. *Calyx* teeth short, imbricate. *Stamens* as many or twice as many as petals.

58. Parkia.

Tribe XIV. Adenantheræ. Herbs, climbing shrubs or trees. *Leaves* 2-pinnate. *Calyx* valvate. *Stamens* twice as many, rarely only as many, as the petals. *Anthers* tipped by a stipitate gland.

59. Entada. *Inflorescence a long spike; woody climbers* with very large pods and seeds.
60. Adenanthera. *Inflorescence a long narrow raceme; trees.*
61. Neptunia. *Inflorescence capitate; aquatic floating or creeping herbs.*
62. Xylia. *Inflorescence capitate; tall trees.*

Tribe XV. Eumimoseæ. Herbs, erect or climbing shrubs, or trees. *Leaves* 2-pinnate. *Flowers* 4–5-merous, rarely 3- or 6-merous. *Calyx* valvate or pappus-like, or 0. *Stamens* twice as many, or only as many, as the petals, free. *Anthers* not gland-tipped; pollen-granules many, distinct.

63. Leucaena. *Pod opening through the sutures, valves continuous; shrubs or small trees.*
64. Mimosa. *Pod with persistent sutures; valves segmented; shrubs or undershrubs.*

Tribe XVI. Acacieæ. Trees, shrubs or woody climbers. *Leaves* 2-pinnate. *Flowers* 4–5-merous, rarely 3-merous or 6-merous. *Calyx* valvate, very rarely 0. *Stamens* indefinite, often very numerous, free, or with the inner rows slightly subconnate at the base into a shallow ring; pollen-masses 2–6.

65. Acacia.

Tribe XVII. Ingeæ. Trees. *Leaves* 2-pinnate sometimes 2–3-geminate, rarely simply pinnate. *Flowers* usually 5-merous. *Calyx* valvate. *Stamens* indefinite often numerous, rarely 10–15, united in a tube at the base or sometimes higher up; anthers small; pollen-masses 2–6.

66. Serianthes. *Pod septate between the seeds, thick, woody, indehiscent; flowers large; trees.*
67. Enterolobium. *Pod septate between the seeds, spongy or fleshy, indehiscent; flowers small; trees.*
68. Calliandra. *Pod thin, straight with thickened sutures, dehiscing elastically; flowers small; trees or shrubs.*
69. Albizzia. *Pod thin, straight, dehiscent or indehiscent; flowers small; trees or shrubs.*
70. Pithecolobium. *Pod coriaceous, curved, indehiscent or dehiscing through lower suture, or fleshy and dehiscing by both sutures; flowers small; trees.*

Sub-order I. Papilionaceæ.

Herbs or shrubs (often climbing), rarely trees. Leaves simple or digitately or pinnately compound; usually stipellate rarely even-pinnate. *Inflorescence* various, often racemose. *Flowers* irregular, usually hermaphrodite, rarely regular. *Sepals* 5, united beyond the disc in a campanulate or tubular calyx with a truncate, 5-toothed or 5-lobed limb, or with limb 4-toothed by union of the two upper segments or 2-lipped by similar union of three lower. *Petals* 5 imbricate or rarely spreading, the upper (*standard*) outer, two lateral (*wings*) usually overlying and free from or attached about the middle to the two lower inner rarely free usually connate below in a curved sheath (*keel*); petals rarely subsimilar and subequal. *Stamens* inserted with the petals on a disc lining the base of the calyx, usually 10 diadelphous in a sheath of 9 connate next keel with 1 free next standand, rarely in 2 lateral sheaths of 5 each; sometimes 9 by abortion of upper filament, or 5 by abortion of alternate stamens; occasionally 10, monadelphous, very rarely 10, free; anthers usually dehiscing longitudinally. *Embryo* with radicle usually inflexed, accumbent. *Albumen* 0 or very scanty.

Stamens mon- or di-adelphous:—
Pods dehiscent by both sutures:—
Leaves even-pinnate the petiole ending in a bristle; stamens 9, the tenth abortive ... ... 1. Abrus.
Leaves odd-pinnate or simple, or digitately 3- or more-foliolate:—
Leaves simple or digitately compound; (pods turgid):—
Leaves simple, sessile, or digitately 3–7-foliolate; stamens monadelphous; seeds many ... ... 2. Crotalaria.
Leaves digitately 3-foliolate or, if 1-foliolate, petioled; stamens diadelphous; seeds 2 ... ... 3. Flemingia.
Leaves pinnately compound:—
Leaves 3-foliolate (5–7-foliolate in one species of *Clitoria*) (Phaseoleæ except *Flemingia*):—
Pods dehiscent from end to end:—
Leaves glandular beneath; (pod compressed; stamens 9+1) (*Cajaneæ* except *Flemingia*):—
Ovules 2; the 2 upper calyx-lobes almost free; (stigma small terminal; seed not strophiolate,) funicle attached to end of hilum ... ... 4. Eriosema.
Ovules 4 or more; the 2 upper calyx-lobes much connate; funicle centric:—
Climbers; stigma small terminal; seeds strophiolate or sub-strophiolate:—
Pod linear acuminate, hardly depressed between the seeds; funicle expanded but seeds not distinctly strophiolate ... 5. Dunbaria.

Pod oblong obtuse, deeply transversely lineate between the seeds; strophiole large ... ... 6. ATYLOSIA.

Woody undershrubs; stigma dilated, oblique; seeds not strophiolate; (pod acute deeply transversely lineate between the seeds) ... 7. CAJANUS.

Leaves not glandular beneath, (leaflets stipellate; climbing species except *Erythrina*):—

Style bearded below the stigma; (stamens 9+1) (*Euphaseoleæ* + *Clitoria*):—

Stigma oblique:—

Keel spirally twisted ... ... 8. PHASEOLUS.

Keel not spiral:—

Style filiform ... ... 9. VIGNA.

Style flattened upwards ... ... 10. PACHYRHIZUS.

Stigma terminal:—

Petals equal in length:—

Pod flattish, not winged ... ... 11. DOLICHOS.

Pod square, 4-winged ... .. 12. PSOPHOCARPUS.

Petals very unequal, standard large; *leaflets sometimes* 5–7 ... ... 13. CLITORIA.

Style not bearded below the stigma:—

Nodes of racemes not swollen (*Glycineæ* except *Clitoria*):—

Petals very unequal, standard large; stamens 9+1, all fertile ... ... 14. CENTROSEMA.

Petals subequal, all small; stamens monadelphous, 5 fertile, 5 alternate sterile ... 15. TERAMNUS.

Nodes of racemes swollen:—

Stamens monadelphous; petals equal (*Diocleæ*):—

Upper lip of calyx not projecting:—

Pod oblong, turgid, 1–2-seeded ... 16. DIOCLEA.

Pod linear, flat, many-seeded ... 17. PUERARIA.

Upper lip of calyx projecting ... 18. CANAVALIA.

Stamens diadelphous (9+1); petals very unequal (*Erythrineæ*):—

Anthers dimorphous; keel exceeding wings and standard ... ... 19. MUCUNA.

Anthers uniform:—

Keel and standard equal, wings very short ... ... 20. STRONGYLODON.

Keel and wings both shorter than standard; *armed trees* ... ... 21. ERYTHRINA.

Pods dehiscent at the seed-bearing apex only, elsewhere seedless and indehiscent:—

Armed trees, keel and wings shorter than standard 21. ERYTHRINA § HYPAPHORUS.

Unarmed climbers; petals equal ... ... 22. SPATHOLOBUS.

Leaves pinnately 5–∞-foliolate; (1-foliolate in some species of *Tephrosia*):—
Anthers apiculate; hairs centrally fixed; (stamens diadelphous, 9+1) ... ... 23. INDIGOFERA.*
Anthers obtuse; hairs basifixed:—
Pods transversely septate between the seeds; (stamens diadelphous, 9+1) ... ... 24. SESBANIA.
Pods not septate; (stamens 9+1, the upper often united in the middle to the staminal sheath):—
Leaflets closely parallel-veined; pod thin early dehiscent; *leaves sometimes* 1–3-*foliolate* ... 25. TEPHROSIA.
Leaflets reticulate-veined; pod thick, tardily dehiscent ... ... 26. MILLETTIA.

Pods indehiscent or, rarely, opening (some *Desmodia*) along the lower suture:—
Pod not segmented; (always indehiscent):—
Leaves odd-pinnate; trees or strong woody climbers:—
Leaflets opposite:—
Stamens monadelphous, the vexillary filament united in the middle to the staminal sheath; pod thickly coriaceous or woody; (calyx truncate):—
Pod wingless ... ... 27. PONGAMIA.
Pod winged ... ... 28. DERRIS.
Stamens quite diadelphous, 9+1:—
Pod winged; calyx truncate ... ... 28. DERRIS § AGANOPE.
Pod wingless; calyx toothed ... ... 29. KUNSTLERIA.
Leaflets distinctly alternate:—
Flowers small, pods narrow ... ... 30. DALBERGIA.
Flowers large, pods suborbicular ... ... 31. PTEROCARPUS.
Leaves even-pinnate, the rachis ending in a bristle, *herbs with hypogæal fruits*... ... ... 32. ARACHIS.

Pod of several (rarely 1) indehiscent 1-seeded segments (in *Desmodium* § *Nicholsonia* dehiscing along the lower suture) (HEDYSAREÆ except *Arachis*):—
Leaves exstipellate:—
Stamens monadelphous, anthers dimorphous; leaves digitately 2–4-foliolate; (joints of pod muricated) ... 33. ZORNIA.
Stamens diadelphous in 2 bundles of 5 each; anthers uniform; leaves pinnate (*Aeschynomeneæ*); (joints of pod papillose or weakly muricated, rarely smooth):—
Leaves even-pinnate, end-leaflet replaced by a bristle; pod folded together within the calyx ... 34. SMITHIA.
Leaves odd-pinnate; pod straight exserted:—
Calyx 5-toothed; ovary sessile, ovules few, joints of pod oblong ... ... 35. ORMOCARPUM.

* None of the simple-leaved or subdigitately-leaved species of *Indigofera* are reported from the Malay Peninsula.

Calyx deeply 2-lipped; ovary stalked, ovules many; joints of pod suborbicular or quadrate ... 36. AESCHYNOMENE.
Leaves stipellate; (stamens 9+1, anthers uniform):—
Ovary 1-ovuled; (leaves pinnately 3-foliolate) ... 37. PHYLACIUM.
Ovary 2- or more-ovuled:—
Pod folded together within the calyx:—
Calyx-teeth setaceous, not accrescent ... 38. URARIA.
Calyx-teeth lanceolate, accrescent ... ... 39. LOUREA.
Pod straight exserted:—
Joints of pod coriaceous about as thick as they are broad and long ... ... 40. ALYSICARPUS.
Joints of pod thin, or if coriaceous (§ *Dendrolobium*) much broader than thick, and if as thick as broad (§ *Scorpiurus*) much longer than broad; opening along lower suture in § *Nicholsonia* and in § *Pleurolobium* ... ... 41. DESMODIUM.
Stamens free:—
Stigma terminal, pod long moniliform ... ... 42. SOPHORA.
Stigma oblique, pod short turgid ... ... 43. ORMOSIA.

1. ABRUS Linn.

Climbing shrubs. *Leaves* with numerous deciduous leaflets. *Flowers* small, in dense racemes on axillary peduncles or short branches. *Calyx* campanulate, equal; teeth very short. *Corolla* much exserted; standard ovate, acute, adhering below to the staminal tube; wings narrow; keel arcuate. *Stamens* 9, united in a tube slit above, the tenth absent; anthers uniform. *Ovary* subsessile, many-ovuled; style short, incurved, beardless, stigma capitate. *Pod* oblong or linear-oblong, flat or turgid, moderately firm, thinly septate. Species 5; cosmopolitan in the tropics.

Pod oblong turgid 3–5-seeded ... ... 1. *A. precatorius.*
Pod linear flat incurved 8–12-seeded ... ... 2. *A. pulchellus.*

1. ABRUS PRECATORIUS Linn. Syst. Veg. ed. XII, 472. A copiously branched climber with thin stems and slender glabrous or thinly silky branches. *Leaves* 2–3 in. long; leaflets equally pinnate in 10–20 opposite pairs membranous glabrous above thinly silky beneath, green deciduous, ligulate-oblong ·35–·65 in. long, ·15–·2 in. wide. *Racemes* many-flowered, crowded, usually shorter than the leaves, rachis usually distinctly thickened in fruit. *Calyx* ·1 in. thinly silky. *Corolla* ·5 in. pink, or white with pink tinge. *Pod* oblong, turgid, 1–1·5 in. long, ·4–·5 in. wide, valves rugose thickened, 3–5-seeded. *Seeds* various, usually bright scarlet with black hilum in wild specimens; sometimes white with black hilum, uniformly white, or uniformly black in cultivated forms. DC. Prodr. II, 381; Roxb. Flor. Ind. III, 258; Wall. Cat., 5818; Miq. Flor. Ind. Bat. I, 158; Bak. in Flor. Brit. Ind. II, 175. *A. minor* Desv. Ann. Sc. Nat. IX, 418. *A. pauciflorus* Desv. Ann. Sc. Nat. IX, 418.

Andamans; very common from the Coco Group to Little Andaman; Barren Island. Nicobars; common. Penang; *Wallich!* *Curtis!* Pangkore; *Scortechini!* Pahang; *Ridley!* Distrib. Cosmopolitan in the tropics.

2. Abrus pulchellus Wall. Cat. 5819. A copiously branched climber with thin stems and slender glabrous or thinly silky branches. *Leaves* 3–4 in. long; leaflets equally pinnate in 12–16 opposite pairs, membranous glabrous above thinly silky beneath, green deciduous, ligulate oblong ·75–1·25 in. long, ·25–·35 in. wide. *Racemes* many-flowered, usually lax always long-peduncled, equalling or exceeding the leaves; rachis little thickened in fruit. *Calyx* ·1 in. thinly silky. *Corolla* ·5 in. pink, or pale blue. *Pod* linear flat incurved 2–2·5 in. long, ·5 in. wide, valves smooth thin, 8–12 seeded. Thwaites, Enum. Pl. Zeyl. 91; Bak. in Flor. Brit. Ind. II, 175. *A., lævigatus* E. Mey. Comm. I, 126; Harv. Fl. Cap. II, 263. *A. melanospermus* Hassk. Cat. Bog. 282; Miq. Flor. Ind. Bat. I, 159. *A. acutifolius* Blume MSS. ex Miq. Flor. Ind. Bat. I, 160.

Andamans; Coco Group, *Prain!* Port Blair, common. Perak; *Kunstler* 1023! *Scortechini* 630! Distrib. S. Africa and S.-E. Asia.

2. Crotalaria Linn.

Herbs or shrubs with simple or digitately 3-foliolate rarely 5–7-foliolate leaves. *Flowers* often large and showy in terminal or leaf-opposed racemes. *Calyx* with short tube, and with lanceolate or linear teeth free or somewhat connate in two lips. *Corolla* equalling or exceeding the calyx; standard rounded or ovate short-clawed; wings obovate or oblong shorter than standard; keel as long as wings, its petals united, much incurved and beaked. *Stamens* monadelphous in a sheath split dorsally, anthers dimorphous, alternately on short filaments versatile and on longer basifixed. *Ovary* sessile or, rarely, stipitate linear usually many-ovuled; style long, abruptly incurved at the base, bearded above, stigma oblique small. *Pod* sessile or, rarely, supported on a gynophore oblong or linear, straight, turgid or inflated, continuous within, 2–∞-seeded. Species about 250, widespread in tropical and sub-tropical regions.

Leaves simple:—
- Stipules decurrent as a persistent wing to the stem ... 1. *C. alata.*
- Stipules, if present, not decurrent:—
  - Pods not longer than the calyx:—
    - Flowers in elongated racemes, petals blue; stipules minute ... ... 2. *C. sessiliflora*
    - Flowers in short few-fld. heads, petals pale yellow; stipules 0 ... ... 3. *C. chinensis.*

Pods much longer than the calyx :—
Pods glabrous, flowers yellow :—
Stems diffuse, racemes lateral ... ... 4. *C. ferruginea.*
Stems erect, racemes terminal :—
Branches stout striated, glabrous or nearly so; leaves stipellate :—
Leaves obtuse or retuse, bracts and stipules small subulate ... ... 5. *C. retusa.*
Leaves acute, bracts and stipules large acute and leafy ... ... 6. *C. sericea.*
Branches slender terete, densely silky; leaves exstipellate ... ... 7. *C. albida.*
Pods hirsute, flowers usually blue, racemes lateral as well as terminal ... ... 8. *C. verrucosa.*
Leaves compound :—
Leaves 3-foliolate :—
Pods small, obliquely subglobose, very few-seeded (hirsute) ... ... 9. *C. uncinella.*
Pods large, cylindric, many-seeded :—
Pods hirsute (narrowly cylindric almost sessile) ... 10. *C. incana.*
Pods glabrous :—
Pods narrowly cylindric, almost sessile .. 11. *C. Saltiana.*
Pods oblong, supported on a long gynophore ... 12. *C. laburnifolia.*
Leaves usually 5-foliolate (at times 3-, 4-, or even 6-7-foliolate ... ... 13. *C. quinquefolia.*

1. Crotalaria alata Ham. in Roxb. Hort. Beng. 98. A suberect undershrub 1–2 feet high; stem and leaves below clothed with short silky pubescence. *Leaves* 1–3 in. long, simple, oblong-ovate or obovate, subacute or obtuse, membranous, the stipules with lanceolate-dentate points forming decurrent wings on the stem for nearly the whole length of the nodes. *Racemes* 2–3-fld., on elongated often leafy lateral peduncles; bracts small, persistent, ovate, acuminate. *Calyx* densely silky, ·35 in. long, tube campanulate, bracteolate. *Corolla* pale-yellow hardly exserted. *Pod* distinctly stalked 1·25–1·75 in. long, linear-oblong, glabrous, 30–40-seeded. Don, Prodr. 241; Roxb. Flor. Ind. III, 274; DC. Prodr. II 124; Wall. Cat. 5356; Benth. in Hook. Lond. Journ. II, 478; Miq. Flor. Ind. Bat. I, 329; Bak. in Flor. Brit. Ind. II, 69. *C. sagitticaulis* Wall. Cat. 5357. *C. bialata* Roxb. Flor. Ind. III, 274.

Singapore; Changi, *Hullett! Ridley!* Distrib. Himalaya; Indo-China; Malay Islands.

2. Crotalaria sessiliflora Linn. Sp. Pl. ed. 2, 1004. A rigid erect annual 1–2 feet high, simple or sparingly fastigiately branched, stem and leaves below shortly silky. *Leaves* 2–6 in. long, simple linear or lanceolate narrowed to both ends thickly herbaceous, quite glabrous above, the stipules setaceous very small. *Racemes* 1–8 in. long, 5–20-

fld., terminal; flowers deflexed close-set (occasionally solitary flowers occur also in the axils of the uppermost stem-leaves); bracts long, setaceous, persistent. *Calyx* densely silky with very long hairs, ·35–·5 in. long, tube shortly campanulate, teeth all long acute, the upper lanceolate, narrow. *Corolla* blue and white, rarely yellow, glabrous, not exserted. *Pod* sessile ·5 in. long, not exserted, oblong, glabrous, 10–15-seeded. DC. Prodr. II, 129; Benth. in Hook. Lond. Journ. II, 565; Miq. Flor. Ind. Bat. I, 338; Bak. in Flor. Brit. Ind. II, 73. *C. anthylloides* Lamk. Encyc. Meth. II, 195; Don, Prodr. 241; Wall. Cat. 5366 A (partly), B, C. *C. salicifolia* Ham. in Don, Prodr. 241 not of Heyne. *C. nepalensis* Link, Enum. II, 228. *C. venusta* Wall. Cat 5365. *C. brevipes* Champ. in Hook. Kew Journ. IV, 44. *C. eriantha* Sieb. & Zucc. Fl. Jap. 13. *C. Oldhami* Miq. Ann. Mus. Lugd. Bat. III, 42. *C. calycina* Kurz, Journ. As. Soc. Beng. XLV, pt. 2, 147 not of Schrank.

Malaya Peninsula; Pahang, *Ridley!* Nicobars; Kamorta, *Kurz!* Distrib. Japan, China, Indo-China, Philippines, Java; Himalayas from Assam westward; Panjab, Central India and Behar.

The specimens collected by Mr. Kurz in Kamorta having yellow flowers were referred by him to *C. calycina*. An examination however shows that they are not *calycina* but *sessiliflora*. A gathering from Java has been issued from Mus. Leyden, also under the name *C. calycina;* this probably indicates that in Java as in the Nicobars, *C. sessiliflora* may have yellow flowers.

3. Crotalaria chinensis Linn. Sp. Pl. ed. 2, 1003. An annual 1–2 feet high, usually breaking into several stoutish ascending branches from near the base, laxly silky with reddish brown hairs. *Leaves* 1–2 in. long, simple, linear to oblanceolate with rounded base and obtuse or subacute apex, thickly herbaceous laxly silky on both surfaces; stipules 0. *Racemes* densely capitate 3-6-fld., all terminal, bracts and bracteoles linear, persistent. *Calyx* laxly silky, ·35–·5 in. long, tube very short, teeth all long acute, the upper lanceolate, lower linear. *Corolla* pale-yellow, glabrous, not exserted. *Pod* sessile ·5 in. long, not exserted, oblong, glabrous, 15–20-seeded. DC. Prodr. II, 130; Benth. in Hook. Lond. Journ. II, 566; Miq. Flor. Ind. Bat. I, 339; Bak. in Flor. Brit. Ind. II, 73.

Perak; Larut river; on rocks in the stream, *Wray!* Distrib. China, Indo-China, Philippines; India; Malay Islands.

4. Crotalaria ferruginea Grah. in Wall. Cat. 5398. A diffuse copiously branching herb with a perennial rootstock, finely silky or shaggy, branches 1·5–2 feet long. *Leaves* very short petioled, herbaceous 1·5–2 in. long, ·5–·75 in. across, simple, ovate-oblong obtuse paler beneath; stipules persistent foliaceous deflexed or spreading, ·25 in. long; petioles ·15 in. long. *Racemes* laxly 2–8-fld. leaf-opposed, 2–4 in. long, bracts linear ·2 in. long often deflexed, pedicels very short. *Calyx*

laxly silky with rusty hairs, ·5 in. long, tube very short, upper teeth lanceolate lower linear. *Corolla* yellow not exserted. *Pod* shortly stalked 1–1·25 in. long glabrous 20–30-seeded. Benth. in Hook. Lond. Journ. II, 476; Bak. in Flor. Brit. Ind. II, 68. *C. canescens* Wall. Cat. 5415. *C. crassifolia* Ham. in Wall. Cat. 5416. *C. leioloba* Bartl. Ind. Sem. Hort. Goett. 1837; Linnæa XII, Litt. 80. *C. pilosissima* Miq. Flor. Ind. Bat. I, 327.

Pahang; Katepong Pekan, *Ridley!* Distrib. India, Indo-China, China; Malay Archipelago.

Mr. Ridley has kindly sent the writer for inspection, from the Singapore Herbarium, the only specimen of this species hitherto collected in the Malay Peninsula. The plant is, however, quite common in Sumatra and Java and may yet be found elsewhere in the Peninsula.

5. Crotalaria retusa Linn. Sp. Pl. 715. An erect robust undershrub 3–4 feet high, with stout striated glabrous branches. *Leaves* 1·5–3 in. long, simple, short-petioled, thickly herbaceous, glabrous above puberulous beneath, oblong-oblanceolate, obtuse or oftener retuse, rarely subacute at apex, cuneate at base, stipules subulate very small. *Racemes* terminal elongated 6–8 in. long laxly 12–20-fld., bracts and bracteoles subulate, pedicels shorter than calyx. *Calyx* almost glabrous, ·35–·5 in., tube short campanulate, half the length of the lanceolate teeth. *Corolla* ·8 in. long, much exserted, yellow with purple tinge. *Pod* glabrous linear-oblong, 1–1·5 in., distinctly stalked, 15–20-seeded. DC. Prodr. II, 125; Roxb. Flor. Ind. III, 272; Bot. Reg. t. 253; Bot. Mag. t. 2561; Wall. Cat. 5405; W. & A. Prodr. 187; Miq. Flor. Ind. Bat. I, 330; Bak. in Flor. Brit. Ind. II, 75. *Lupinus cochinchinensis* Lour. Flor. Cochinch. 429; DC. Prodr. II, 410. *Tandale-cotti* Rheede, Hort. Malab. IX, t. 25.

Malay Peninsula; Malacca, *Maingay! Hervey!* Pahang, *Ridley!* Andamans; Port Blair, very common; having been introduced as a plant of native gardens, it has now run wild throughout the settlement. —Distrib. General in the tropics.

6. Crotalaria sericea Retz, Obs. V, 26. A robust undershrub 3–4 feet high with stout striated almost glabrous branches. *Leaves* 2–6 in. long, simple, short petioled, thickly herbaceous, glabrous above, finely silky beneath, oblong-oblanceolate acute or subacute at apex, cuneate at base; stipules large leafy persistent. *Racemes* terminal elongated 10–12 in. long, laxly 20–50-fld., bracts ovate leafy persistent, pedicels longer than calyx. *Calyx* almost glabrous ·5 in. long, tube short campanulate half the length of the lanceolate teeth. *Corolla* ·8 in. long, much exserted, yellow with purple tinge. *Pod* glabrous linear-oblong 1–2 in. long, distinctly stalked 20–30-seeded. DC. Prodr. II,

126; Roxb. Fl. Ind. III, 273; Wall. Cat. 5406; W. & A. Prodr. 186; Miq. Flor. Ind. Bat. I, 330; Bak. in Flor. Brit. Ind. II, 75. *C. spectabilis* Roth, Nov. Sp. 341; DC. Prodr. II, 125. *C. macrophylla* Weinm. Syll. II, 26. *C. cuneifolia* Schrank, Syll. II, 78.

Malay Peninsula; Malacca, *Griffith.* Andamans; Table Island, *Prain!* Distrib. India and Indo-China.

Very like the preceding, but easily distinguished, even in those cases where the foliage is similar, by the large stipules and bracts.

7. Crotalaria albida Heyne ex Roth, Nov. Sp. Pl. 333. An undershrub 1–2 feet high with numerous firm slender terete obscurely silky branches. *Leaves* simple linear or oblanceolate obtuse firm shining gland-dotted glabrescent above, thinly silky beneath, 1–2 in. long ·2–·25 in. wide, petiole ·1 in., stipules 0. *Flowers* in terminal, or rarely lateral, laxly 6–20-fld. racemes, 2–4 in. long; bracts linear ·05–·1 in. long; pedicels ·15–·2 in. long slender adpressed-puberulous. *Calyx* turbinate ·25 in. long, in fruit ·35 in. long, thinly silky; teeth long the 3 lower linear acuminate, the 2 upper broader often subobtuse. *Corolla* pale yellow glabrous ·3 in. long. *Pod* glabrous sessile, oblong-cylindric ·5–·6 in. long, half as long again to twice as long as calyx; seeds 6–12. W. & A. Prodr. 189; Bak. in Flor. Brit. Ind. II. 71. *C. montana* Roxb. Hort. Beng. 54; Flor. Ind. III, 265; W. & A. Prodr. 182. *C. scoparia* Wall. Cat. 5418. *C. parva* Grah. in Wall. Cat. 5402. *C. punctata* Grah. in Wall. Cat. 5401 A, 5401 C. *C. tennis* Wall. Cat. 5403.

Selangor; roadsides at Kwala, *Ridley* 7293! Distrib. Throughout South Eastern Asia.

A species perhaps only recently introduced to the Malay Peninsula from India; in India and Indo-China the plant is very common in grassy places.

8. Crotalaria verrucosa Linn. Sp. Pl. 715. A woody herb 2–3 feet high with many angular branches puberulous at first but soon glabrescent. *Leaves* 2–6 in. long, simple short petioled, thin, obscurely downy beneath, ovate, obtuse or occasionally acute at apex, deltoid at base; stipules moderately large leafy semilunate. *Racemes* terminal and lateral, about 6 in. long, rather closely 12–20-fld., bracts linear minute, pedicels about as long as calyx. *Calyx* ·3 in. long, obscurely downy, tube short campanulate, half the length of lanceolate teeth. *Corolla* ·75 in. long, exserted, usually white and blue, often white, occasionally yellow. *Pods* faintly hirsute, oblong, 1–1·5 in. long, distinctly stalked, 10–15-seeded. DC. Prodr. II, 125; Bot, Mag. t. 3034; Wall. Cat. 5392; W. & A. Prodr. 187; Wight Ic. t. 200; Miq. Flor. Ind. Bat. I, 331 Bak. in Flor. Brit. Ind. II, 77. *C. angulosa* Lamk. Encyc. Meth. II, 197; Roxb. Flor. Ind. III, 273. *C. cærulea* Jacq. Ic. t. 144. *C. acuminata* G. Don., Dict. II, 134.—Rheede, Hort. Malab. IX, t. 29.

Malay Peninsula; Perak, *Scortechini!* Malacca, *Griffith.* Pahang, *Ridley!*

9. Crotalaria uncinella Lamk. Encyc. Meth. II, 200. An almost stemless undershrub with several subprocumbent slender flexuous spreading branches 1–2 feet long, slightly puberulous. *Leaves* compound 3-foliolate, petioles 1 in. long, leaflets subequal or the terminal slightly the larger, 1–1·5 in. long, ·5–·75 in. wide, glabrous above slightly hirsute beneath, elliptic obtuse entire; stipules small, acute, rigid, recurved, glabrous above hirsute beneath. *Racemes* lateral and terminal 2 in. long, 20–25-fld.; flowers close-set, bracts small recurved ovate acuminate. *Calyx* hirsute ·15 in. long, teeth lanceolate. *Corolla* ·25 in. long, exserted, yellow, glabrous. *Pod* obliquely subglobose, closely adpressed-pubescent, 2-seeded; style sharply hooked. Lamk. Ill. t. 617, f. 2. *C. elliptica* Roxb. Hort. Beng. 54; Flor. Ind. III, 279; Miq. Flor. Ind. Bat. I, 344; Benth. in Hook. Lond. Journ. II, 580; Flor. Hongk. 75; Forbes & Hemsl. Ind. Sinens., I, 151. *C. Vachellii* H. & A. Bot. Beech. Voy. 180; Walp. Rep. I, 588. *Rhynchosia aurea* Ridl. Trans. Linn. Soc., Ser. II, III, 293 not of DC.

Malay Peninsula; Pahang, *Ridley!* Malacca, *Derry! Goodenough!* Distrib. China.

First described by Lamarck from specimens received by him from Mauritius; probably the plant had been there introduced; at all events Mr. Baker does not cite it, even as a stranger, in his *Flora of Mauritius*. Afterwards described, independently, by Roxburgh, from specimens reared in the Calcutta garden, and therefore, though issued by Wallich, deliberately excluded from the Indian Flora by Wight and Arnott, who have been in this followed by Baker in the *Flora of British India*. Its discovery in Pahang by Mr. Ridley, in whose list it stands as *Rhynchosia aurea*, and in Malacca where it is apparently quite common, shows that after all it deserves to be included in the Indian Flora.

10. Crotalaria incana Linn. Sp. Pl. 716. An erect undershrub 2–4 feet high with robust terete loosely downy branches. *Leaves* compound 3-foliolate petioles 2–3 in. long, leaflets membranous, quickly glabrescent above sparsely hirsute beneath terminal 1·5–2 in. long, larger than lateral all ovate, obtuse at apex and rounded or widely cuneate at base; stipules minute setaceous. *Racemes* terminal and lateral 6–10 in. long, rather closely 12–20-fld., bracts minute. *Calyx* ·25 in. long, loosely downy, teeth lanceolate twice as long as the tube. *Corolla* ·6 in. long, exserted, yellow, glabrous. *Pod* subsessile slightly deflexed and slightly recurved, cylindric 1–1·25 in. long, permanently pubescent with spreading brown silky hairs; 20–30-seeded. DC. Prodr. II, 132; Bot. Reg. t. 377; Miq. Flor. Ind. Bat. I, 347; Bak. in Flor. Brit. Ind. II, 83. *C. Schimperi* A. Rich. Fl. Abyss. I, 151. *C. herbacea* Schweig. in Schrank, Syllog. Ratisb. II, 77.

Penang; *Curtis!* Distrib. Cosmopolitan in the tropics, originally American.

There is one specimen of this in Mr. Curtis' own Herbarium. No other collector has sent it from Malaya.

11. Crotalaria Saltiana Andr. Bot. Rep. t. 648. An erect shrub 2–4 feet high with robust smooth or slightly sulcate thinly silky branches. *Leaves* compound, 3-foliolate, petioles 2–3 in long, leaflets membranous, glabrous above very sparingly silky below, terminal 1·5–2·5 in. long, larger than lateral, all obtuse cuneate at base; stipules minute, deciduous. *Racemes* terminal and occasionally also lateral, usually 1–1·25 feet long, laxly 20–50-fld.; bracts minute. *Calyx* ·25 in. long, thinly silky; teeth lanceolate as long as campanulate tube. *Corolla* ·6 in. long, exserted, yellow with purple stripes or pure yellow, glabrous. *Pod* subsessile deflexed, subrecurved puberulous when young, ultimately glabrous, cylindric, 1·5 in. long, 20–30-seeded. *C. striata* DC. Prodr. II, 131; Miq. Flor. Ind. Bat. I. 346; Bak. in Flor. Brit. Ind. II, 84 (excluding the synonyms *C. Brownei* Bertero and *C. latifolia* Roxb.)

Malay Peninsula; Perak, *Wray! Scortechini!* Penang, *King!* Malacca, *Maingay!* Singapore, *Kunstler!* Pahang, *Ridley.*

Nearly related to, and at times mistaken for *C. Brownei* Bertero ex DC. in Prodr. II, 130 (*C. lanceolata* Roxb. Hort. Beng. 54 [nomen prius] nec Meyer; *C. latifolia* Roxb. ex Wall. MSS. in Hort. Calcutta) a native ofthe West Indies, but now occasionally met with as a spontaneous species in India. From *C. Saltiana*, *C. Brownei* differs in having more numerous lateral racemes, with flowers always close-set and racemes never exceeding 6 in., and in having much larger leaflets acute at apex as well as base and more densely silky underneath. The leaves of *C. Saltiana* are like those of the next species; of *C. Brownei* like those of *C. bracteata* and of *Priotropis cytisoides* for both of which species it has, at times, been mistaken.

12. Crotalaria laburnifolia Linn. Sp. Pl. 715. An erect shrub 2–4 feet high with long slender rounded glabrous branches. *Leaves* compound, 3-foliolate, petioles 2–3 in. long, leaflets membranous, glabrous on both surfaces, terminal 1–2 in. long, hardly larger than lateral, all subacute or obtuse, cuneate at the base; stipules 0. *Racemes* terminal and lateral 6–12 in. long, few- and very lax-fld.; bracts minute deciduous, pedicels ·5 in. long. *Calyx* ·3–·4 in. long, glabrous turbinate, teeth lanceolate as long as tube. *Corolla* 1 in. long, much exserted, pure yellow, glabrous, keel much incurved. *Pod* pendulous from a filiform gynophore ·75–1 in. long, glabrous, cylindric 1·5–2 in. long, 20–30-seeded. DC. Prodr. II, 130; Roxb. Fl. Ind. III, 275; Wall. Cat. 5424, mostly; W. & A. Prodr. I, 193; Miq. Flor. Ind. Bat. I, 345; Bak. in Flor. Brit. Ind. II, 84. *C. pendula* Bert. in DC. Prodr. II, 130. *C. pedunculosa* Desv. Journ. Bot. III, 76; DC. Prodr. II, 132. *Clavulium pedunculosum* Desv. Ann. Sc. Nat. IX, 407. *Nellia-tandalecotti* Rheede, Hort. Malabar. IX, t. 27.

Malay Peninsula; Malacca, *Griffith! Maingay! Hervey!* Distrib. India; Malay Archipelago; Philippines.

13. Crotalaria quinquefolia Linn. Sp. Pl. 716. An erect annual 2–4 feet high with straight robust sulcate fastigiate sparingly silky branches. *Leaves* digitate normally 5-foliolate, at times 3-, 4-, or even 6–7-foliolate, petioles 1–3 in. long, leaflets herbaceous, glabrous above, thinly silky beneath, central largest 2–4 in. long, all linear or occasionally narrowly oblanceolate obtuse; stipules linear. *Racemes* terminal, 6–8 in. long, laxly 8–20-fld.; bracts linear as long as pedicels, thinly silky, persistent; lower pedicels as long as calyx, upper short. *Calyx* subglabrous ·5 in. long; teeth lanceolate as long as campanulate tube. *Corolla* 1 in. long, glabrous, yellow, white or rarely purplish. *Pod* distinctly stalked subinflated, glabrous, 1·5–2 in. long, ·75 in. wide, 30–40-seeded. DC. Prodr. II, 135; Roxb. Flor. Ind. III, 279; Wall. Cat. 5429; W. & A. Prodr. I, 194; Wight Ill, t. 16; Miq. Flor. Ind. Bat. I, 347; Bak. in Flor. Brit. Ind. II, 84. *C. heterophylla* Linn. f. Suppl. 323; DC. Prodr. II, 131.

Malay Peninsula; Kedah, *Kunstler!* Singapore, *Hullett!* Distrib. India; Indo-China; Malay Archipelago; Philippines.

3. Flemingia Roxb.

Shrubs, rarely herbs, with leaves digitately 3-foliolate or simple, gland-dotted below. *Inflorescence* various; pedicels very short, not bracteolate. *Calyx-tube* short; teeth narrow, acuminate, the lowest often the longest. *Corolla* little or not at all exserted; petals equal in length; keel obtuse or slightly rostrate. *Stamens* diadelphous; anthers uniform. *Ovary* subsessile, 2-ovuled; style filiform, beardless, stigma capitate. *Pod* oblong, turgid, small, usually two-seeded; seeds not strophiolate, the funicle centrical. Species about 25; 3 Tropical African, the remainder Asiatic.

Leaves 1-foliolate; flowers in small cymes hidden by large folded persistent bracts and arranged in racemes longer than the leaves	1. *F. strobilifera.*
Leaves 3-foliolate; flowers in simple solitary or fascicled axillary racemes shorter than the petioles, bracts small deciduous	2. *F. congesta.*

§ Ostryodium Desv. Shrubs. *Leaves* simple. *Flowers* in small cymes, each hidden by a large folded persistent bract, closely distichously arranged in copious simple or slightly branched racemes, both in the axils of the leaves and above them.

1. Flemingia strobilifera R. Br. in Ait. Hort. Kew. ed. II, IV, 350. An erect shrub 5–10 feet high with slender terete branches velvety towards their tips. *Leaves* 4 in. long, petioles ·5 in. long, adpressed

puberulous; leaflets 1, subcoriaceous green glabrescent above thinly silky on the nerves beneath, ovate-acute, base widely rounded or truncate 3·5 in. long, 2 in. wide, lateral nerves 10–12 pairs; stipels obsolete, stipules scarious lanceolate ·3 in. long. *Inflorescence* in terminal racemes or thyrses 3–6 in. long, the slender zigzag rachis rusty-pubescent; bracts erecto-patent, short-petioled, deeply cordate 1 in. long, 1·25 in. wide, membranous, apex shortly cuspidate in all except the very uppermost. *Calyx* ·25 in. finely pilose; teeth lanceolate, exceeding the tube. *Corolla* yellowish or greenish-white ·35 in. long. *Pod* oblong turgid ·35 in. long, finely downy; 2-seeded. DC. Prodr. II, 351; Wall. Cat. 5753; W. & A. Prodr. 243; Wight Ic. t. 267; Miq. Flor. Ind. Bat. I, 161; Bak. in Flor. Brit. Ind. II, 227 (excluding both varieties). *F. abrupta* Wall. Cat. 5755. *Hedysarum strobiliferum* Linn. Sp. Pl. 746; Roxb. Flor. Ind. III, 350. *Zornia strobilifera* Per. Synops. II, 319.

In all the provinces, common. Distrib. Throughout S.-E. Asia.

§ 2. Flemingiastrum DC. Erect shrubs. *Leaves* digitately 3-foliolate. *Flowers* in dense subspicate axillary racemes; bracts linear or lanceolate, caducous.

2. Flemingia congesta Roxb. Hort. Beng. 56. An erect woody shrub 4–6 feet high with slender triangular sulcate branches silky towards their tips. *Leaves* 6–9 in. long, petioles 2·5–3·5 in. long, adpressed puberulous margins angled but hardly winged; leaflets 3, subcoriaceous, ovate-acute, terminal cuneate lateral obliquely round at base, green, puberulous above thinly rusty silky especially on the nerves beneath, 3–5 in. long, 1·5–3 in, wide, lateral nerves 5–7 pairs, the lowest pair long, very oblique, arising at junction of midrib and petiolule, stipels obsolete, petiolules ·25 in. long, stipules scarious externally velvety, early caducous ·4 in. long. *Inflorescence* in dense axillary racemes sometimes solitary in the higher, usually fasciculate in the lower axils, 2 in. long, always shorter than petioles; bracts lanceolate ·25 in. long or less, silky externally less rigid than the stipules and like them deciduous. *Calyx* ·35 in. long, densely silky externally, teeth linear-lanceolate the lowest exceeding the others. *Corolla* wings purple standard white striped with pink ·4 in. long. *Pod* oblong ·5 in. long, ·25 in. wide, closely shortly tomentose; seeds 2. Roxb. Fl. Ind. III, 340; DC. Prodr. II, 351; W. & A. Prodr. 241; Wight, Ic. t. 390; Wall. Cat. 5747; Miq. Flor. Ind. Bat. I, 164; Bak. in Flor. Brit. Ind. II, 288, excluding all the varieties. *Crotalaria macrophylla* Willd. Sp. Pl. III, 982. *Rhynchosia crotalarioides* DC. Prodr. II, 387.

Penang; *Wallich* 5747 F! Pulo Bœting, *Curtis* 1926! Malacca; *Griffith!* Pangkore, *Goodenough!* Perak; Larut, *Scortechini* 134! Kampong Kota, *Wray* 3316! Distrib. India, Indo-China, Java.

All the specimens quoted belong to Roxburgh's true *Flemingia congesta*.

4. Eriosema DC.

Shrubs or herbs, mostly suberect, with 1–3-foliolate leaves. *Flowers* racemed or axillary. *Calyx* campanulate; teeth 5, as long as the tube. *Corolla* distinctly exserted; limb of standard roundish, auricled at the base; wings and slightly beaked keel shorter. *Stamens* diadelphous; anthers uniform. *Ovary* sessile, 2-ovuled; style filiform, glabrous, stigma capitate. *Pod* oblong, turgid, 1–2-seeded; seeds oblique, the funiculus attached to the extremity of a linear hilum. Species about 50, mostly Trop. African and American.

Eriosema chinense Vogel. Pl. Meyen. 31. An erect undershrub 1–1·5 feet high, stems slender branching virgately usually near base, densely pubescent one or more from a small tuberous woody rootstock 1·5 in. long, ·75 in. across. *Leaves* 1–2 in. long, ·3–·4 in. across, 1-foliolate very short petioled, linear-oblong to linear-lanceolate, subcoriaceous, greenish with a few adpressed hairs above densely grey-tomentose beneath, the veins rusty brown tomentose; stipules linear scarious 2-nerved persistent ·2 in. long, stipels minute. *Flowers* in axils of upper leaves, solitary or geminate subsessile or on a common pedicel, sometimes ·5 in. long jointed below flower, bracteoles obsolete. *Calyx* campanulate densely pilose ·2 in. long. *Corolla* yellow, drying black, ·4 in. long, standard orbicular hairy externally. *Pod* oblong ·4 in. long, pubescent with long spreading rufous hairs. Bak. in Flor. Brit. Ind. II, 219. *Crotalaria tuberosa* Ham. in Don. Prodr. 241. *Rhynchosia virgata* Grah. in Wall. Cat. 5503. *R. Grahami* Wall. Cat. 5504. *Pyrrotricha tuberosa* W. & A. Prodr. 238.

Perak; *Wray* n. 3804! Malacca; *Griffith*. Distrib. S.-E. Asia; N. Australia.

5. Dunbaria W. & A.

Woody or herbaceous climbers. *Leaves* 3-foliolate, distinctly gland-dotted beneath; stipellæ rarely present. *Flowers* racemose or axillary. *Calyx* teeth narrow the lowest distinctly exceeding the others. *Corolla* exserted, marcescent or caducous; keel usually not beaked. *Stamens* diadelphous anthers uniform. *Ovary* sessile or stalked, many-ovuled; style inflexed filiform beardless, stigma capitate. *Pod* linear, flat not marked with depressed lines between the substrophiolate seeds. Species about 12, Eastern Asiatic, Japanese and North Australian; only one from our area.

§ Rhyncolobium. Corolla caducous.

Dunbaria Scortechinii Prain. A slender creeper 10–20 feet long with rigid subsulcate grey canescent stem and branches. *Leaves* 4–6 in. long, 3-foliolate; leaflets subtrapezoid, cuspidate acuminate at apex narrowed from below the middle to a rounded base, the lateral pair

obliquely; blueish-green faintly puberulous above, densely grey-canescent beneath 2–2·5 in. long, 1·75–2 in. wide; petiole 1·5–4 in. long, puberulous; petiolules ·15 in. long, puberulous; stipels very minute caducous, stipules lanceolate ·1 in. long caducous. *Racemes* 2–3 in. long on peduncles 4–6 in. long, overtopping the leaves; pedicels geminate ·2 in. long. *Calyx* grey-pubescent with reddish streaks, ·3 in. long, tube wide campanulate, lower tooth lanceolate as long as tube and twice as long as lateral deltoid and connate upper pair. *Corolla* ·5 in. long, externally dark brown, within pale yellow; keel beaked, standard ·6 in. wide, orbicular entire. *Pod* 2·5 in. long, ·25 in. wide, linear, pedicel abruptly recurved, closely grey-canescent; 6–8 seeded.

Perak; in open grassy or bamboo jungles, at Dijong, *Scortechini*, 1841! *Kunstler*, 908! Ulu Bubong, *Kunstler*, 10852!

A species with somewhat the appearance of *Rhynchosia bracteata* but with much more slender stems. It also resembles, but to a less degree, *Atylosia mollis* Its pods, however, have no depressions between the seeds and this renders it necessary to refer the plant to *Dunbaria*.

6. Atylosia W. & A.

Herbs or shrubs, erect or twining. *Leaves* 3-foliolate, sometimes subdigitate often exstipellate, gland-dotted beneath. *Flowers* axillary or racemed. *Calyx* teeth distinct, longer or shorter than the tube the lowest the longest. *Corolla* more or less exserted, marcescent or caducous; keel not beaked. *Stamens* diadelphous; anthers uniform. *Ovary* sessile; ovules 3 or more; style filiform incurved glabrous, stigma capitate. *Pod* linear or oblong, turgid, marked with horizontal or oblique transverse lines between the seeds which have a conspicuous divided strophiole. Species about 25; from India to Australia and Mauritius.

Petals marcescent, leaflets large pinnately trifoliolate ... 1. *A. crassa.*
Petals deciduous, leaflets small subdigitate ... ... 2. *A. scarabæoides.*

§ Atylia. Petals marcescent, remaining till the pod developes.

1. Atylosia crassa Prain. A twining species with firm slender striate shortly-tomentose stems and branches. *Leaves* 3–6 in. long, pinnately 3-foliolate; leaflets subtrapezoid cuspidate-acuminate at apex narrow from beyond the middle to a rounded base, the lateral pair obliquely, dark green and rather densely puberulous especially on the nerves above, densely greenish-brown pubescent and reticulately veined beneath, 2–3 in. long, 1·75–2·25 in. wide; petiole 1·5–2·5 in. long, pubescent; petiolules ·15 in. stipels subulate ·1 in. long, pubescent, subpersistent, stipules minute caducous. *Racemes* 2–3 in. long, lax short-peduncled, pedicels geminate ·3–·5 in. long; bracteoles large roundish acute reddish ·6 in. long, forming a conspicuous tuft before the racemes expand. *Calyx* ·4 in. finely grey-downy lowest tooth lanceolate as long

as the narrowly campanulate tube. *Corolla* yellow, ·75 in. long. *Pod* 1–1·25 in. long, ·6 in. wide, straight, rounded at both ends closely greenish-brown viscidly puberulous, 3–5-seeded, obliquely transversely depressed between the smallish seeds of which the longer diameter is parallel to the direction of the pod. *Dolichos reticulatus* Ham. in Wall. Cat. 5552 not of Ait. *D. crassus* Grah. in Wall. Cat. 5553. *Dunbaria Horsfieldii* Miq. in Flor. Ind. Bat. I, 179. *Atylosia mollis* Benth. in Pl. Jungh. 243 (excluding syn. *Collæa mollis* Grah.) ; Bak. in Flor. Brit. Ind. II, 213 (excl. syn. *Collæa mollis* Grah., *Atylosia glandulosa* Dalz., and *Cajanus glandulosus* Dalz. & Gibs.)

Andamans ; very common. Distrib. India, Indo-China, Malay Archipelago.

The prior name for this species is *Dolichos reticulatus* Ham. but the name *Atylosia reticulata* may not be employed for it owing to there being another *A. reticulata* from Australia based on the *Dolichos reticulatus* Ait. of the *Hortus Kewensis* which was known before our plant. The nearest ally of this species is the purely Himalayan and quite distinct *A. mollis* Bth. (*Collæa mollis* Grah.)

§ Cantharospermum. Petals falling before the pod developes.

2. Atylosia scarabæoides Benth. Pl. Jungh. 243. A slender biennial herbaceous twiner with densely grey-downy stems and branches. *Leaves* 1·5–2 in. long, subdigitately 3-foliolate; leaflets obovate-oblong subcoriaceous flexible 1–1·5 in. long, ·5–·75 in. wide, obtuse or subacute thinly grey-canescent above, densely pubescent, 3-nerved in lower two-thirds and faintly reticulate-veined beneath ; petiole ·5 in. long, brownish pubescent ; stipels 0, stipules minute caducous. *Racemes* 2–6-fld., on densely pubescent axillary peduncles ·3—·4 in. long ; pedicels ·25 in. long also pubescent. *Calyx* ·25 in., densely brownish-grey silky, teeth linear, the lowest twice as long as tube. *Corolla* ·4 in. long, keel abruptly incurved at tip. *Pod* straight ·75–1 in. long, ·25 in. wide, clothed with fine spreading brown silky hairs, with slightly oblique transverse depressed lines between the 4–5-seeds. Miq. Flor. Ind. Bat. I, 173 ; Bak. in Flor. Brit. Ind. II, 215. *Dolichos scarabæoides* Linn. Sp. Pl. 726. *Cajanus scarabæoides* Thouars ex Grah. in Wall. Cat. 5580. *Rhynchosia scarabæoides* DC. Prodr. II, 387. *R. biflora* DC. Prodr. II. 387. *Cantharospermum pauciflorum* W. & A. Prodr. 255.

Malacca ; *Griffith !* Distrib. India, Indo-China, Malaya, China, Mascarene Islands.

7. Cajanus DC.

An erect shrub. *Leaves* 3-foliolate. *Flowers* racemed. *Calyx*-tube campanulate ; teeth short. *Corolla* much exserted, its petals equal in length ; keel truncate. *Stamens* diadelphous ; anthers uniform. *Ovary* subsessile, few-ovuled ; style long, filiform, much upcurved, stigma capi-

tate. *Pod* linear, straight, narrowed at both ends, 3–5-seeded, torulose with oblique linear depressions between the non-strophiolate seeds. The only species.

Cajanus indicus Spreng. Syst. III, 248. An erect shrub 6–8 feet high with slender grooved grey-silky branchlets. *Leaves* 2–5 in. long; petiole ·5–1·5 in. finely fluted densely adpressed hoary; leaflets 3 oblong-lanceolate entire subcoriaceous, terminal 1·75–3 in. long, ·5–1·25 in. wide lateral similar but smaller 1·25–1·75 in. long, ·35–·75 in. wide, thinly silky above densely shortly silky and indistinctly gland-dotted beneath, nerves 6–9 pairs oblique prominent; stipels minute; stipules lanceolate hoary-canescent externally, ·15 in. long. *Inflorescence* in sparse corymbose axillary racemes with peduncles 2 in. long and in a terminal panicle; pedicels downy the lowest ·5 in. long, bracteoles obsolete. *Calyx* campanulate ·25 in. long, teeth triangular shorter than tube. *Corolla* ·6–·75 in., standard yellow, or yellow with red veins, or rarely red. *Pod* 2–3 in. long, ·25–·45 in. wide, finely downy, with oblique cross depressions between the 2–6 seeds; armed at tip with thickened base and lower half of style; testa firm from pale to dark brown. W. & A. Prodr. 256; Miq. Flor. Ind. Bat. I, 174; Bak. in Flor. Brit. Ind. II, 217. *C. flavus* DC. Prodr. II, 406. *C. bicolor* DC. Prodr. II, 406; Wall. Cat. 5577. *Cytisus Cajan* Linn. Sp. Pl. 739; Roxb. Flor. Ind. III, 325. *C. pseudo-Cajan* Jacq. Hort. Vindob. t. 119.

Andamans; Perak; Penang; Malacca. Distrib. Cultivated everywhere in the tropics; probably a native of S.-E. Asia.

8. Phaseolus Linn.

Twiners, usually herbaceous, with 3-foliolate stipellate leaves. *Flowers* in copious axillary racemes; bracteoles usually conspicuous and persistent. *Calyx* campanulate, the lowest tooth usually longer than the rest and the two uppermost subconnate. *Corolla* much exserted, the keel prolonged into a very long beak which forms a complete spiral. *Stamens* diadelphous; anthers uniform. *Ovary* sessile, many-ovuled; style filiform, twisted round with the keel, conspicuously bearded down the side below the very oblique stigma. *Pod* linear, rarely oblong, subterete or subcompressed, more or less distinctly septate between the seeds. Species about 60, mostly tropical, many widely cultivated, especially in America.

Stipules small basifixed:—

Petals yellow puberulous externally, pods broad subcompressed	1.	*P. lunatus.*
Petals red glabrous, pods narrow subtorulose between seeds	2.	*P. adenanthus.*

Stipules produced below point of insertion (petals yellow, glabrous) :—

Pods subcylindric glabrous :—

Stems slender diffuse, racemes subcapitate, leaflets less than half as long as petioles, seeds rounded at ends ... 3. *P. trilobus.*

Stems twining, racemes subspicate, leaflets as long as petioles, seeds subtruncate ... ... 4. *P. calcaratus.*

Pods slightly compressed, pubescent; (racemes subcapitate, seeds rounded at ends) ... ... 5. *P. Mungo.*

§ Euphaseolus. Stipules small, basifixed. Pods broad subcompressed.

1. Phaseolus lunatus Linn. Sp. Pl. 724. A tall twining biennial with stems at first finely downy but soon glabrescent. *Leaves* 6–8 in. long, leaflets 3, pale-green membranous entire rather wide triangular acute, base wide cuneate—of lateral leaflets obliquely, glabrous above minutely sparsely puberulous beneath, 3–4 in. long, 2–2·5 in. wide; petiole 4–6 in. long, and petiolules ·2 in. long puberulous; stipels ·15 in. long ovate-acute; stipules hardly larger and similar. *Racemes* axillary lax 2–6 in. long peduncles short the lower nodes distant; flowers in fascicles of 2–4, pedicels ·35 in. long, bracts minute. *Calyx* ·1 in. long minutely 2-bracteolate at the base, puberulous externally teeth wide triangular very short. *Corolla* greenish-yellow ·35 in. long puberulous externally. *Pod* decidedly compressed 2–3 in. long, ·6–·75 in. wide, ·25 in. thick; upper suture recurved, lower widely rounded. DC. Prodr. II, 393; Roxb. Flor. Ind. III, 287; W. & A. Prodr. 244; Miq. Flor. Ind. Bat. I, 194; Bak. in Flor. Brit. Ind. II, 200. *P. vulgaris* Wall. Cat. 5595 not of Linn.

In all the provinces, cultivated.

An American species now widely spread in the old world.

§ Leptospron Bth. & Hk. f. Stipules medium, basifixed. Pods narrow subcompressed.

2. Phaseolus adenanthus G. W. F. Mey. Prim. Flor. Esseq. 239. A spreading glabrescent perennial, with slender rigid stems. *Leaves* 4–6 in. long; leaflets 3 medium to pale green, chartaceous, ovate-acute base cuneate—of lateral leaflets obliquely, nerves on both surfaces at first sparsely puberulous, otherwise glabrous, 2·5–4 in. long, 1·25–2 in. wide; petiole 2·5 in. long channelled above very sparsely hirsute or glabrous, petiolules ·2 in. long puberulous; stipels ·1 in. ovate adpressed, stipules often reflexed ovate-acute ·2 in. long. *Racemes* axillary rather crowded, peduncles 1–4 in. long nodes rather close together; flowers 1–3 from each node, pedicels under ·1 in. long, bracts minute. *Calyx* ·25 in. long campanulate, teeth deltoid to lanceolate half as long as tube, with 2 ovate bracteoles ·1 in. long at its base. *Corolla* pink to purple, showy, 1 in.

long glabrous. *Pod* decidedly compressed 4–6 in. long, ·4 in. wide, ·2 in. thick upper suture much recurved, subtorulose between the 10–16 brown or red seeds ·3 in. long, ·25 in. wide, with a small hilum. Bak. in Flor. Brit. Ind. II, 200. *P. alatus* Roxb. Hort. Beng. 54; Flor. Ind. III, 288 not of Linn. *P. amarus* Roxb. ex W. & A. Prodr. 244. *P. rostratus* Wall. Pl. As. Rar. I, 50, t. 63; Cat. 5610; W. & A. Prodr. 244; Wight, Ic. t. 34. *P. truxillensis* H. B. K. Nov. Gen. & Sp. VI, 451; DC. Prodr. II, 392. *P. senegalensis* Guill. & Perr. Fl. Seneg. 217.

Andamans; N. Andaman, *Helfer!* S. Andaman, *King's Collector!* Narcondam, growing on the boulders of the higher beach, *Prain!* Distrib. Cosmopolitan in the tropics.

A very beautiful species not yet reported from the Malay Peninsula proper and not recorded by Prof. Miquel from the Malay Archipelago. It may, however, be found if looked for in the sea-fences of screw-pines along the coasts, this being the habitat chiefly affected by it in the Andaman group.

§ Strophostyles Bth. & Hk. f. Stipules produced below their point of insertion.

3. Phaseolus trilobus Ait. Hort. Kew., ed. I, III, 30. A slender diffuse spreading glabrous or slightly pubescent annual or perennial weed with stems reaching 2–3 feet. *Leaves* 4 in. long; leaflets 3 pale green membranous, 3-lobed or, especially the terminal, at times entire, less often 3-fid to -partite, small suborbicular ·75–1 in. in diam. rarely oblong 1·5 in. long by 1 in. wide; petiole long 2–3 in. usually glabrous, petiolules ·2 in.; stipels ovate-acute under ·1 in.; stipules ·25–·5 in. long, ovate-oblong. *Racemes* axillary subcapitate, at ends of erect stoutish peduncles 6–12 in. long, bracts ovate-acute ·15–·2 in. long deciduous; pedicels ·1 in. *Calyx* campanulate ·07–·1 in. yellowish-green, teeth minute deltoid, bracteoles at base lanceolate longer than calyx. *Corolla* yellow ·2–·25 in. long glabrous. *Pod* cylindric 1–2 in. long, ·15 in. in diam. glabrous straight or slightly recurved, 6–12 seeded. Roxb. Hort. Beng. 54; Flor. Ind. III, 298; Wall. Cat. 5588, chiefly; W. & A. Prodr. 246; Wight, Ic. t. 94; Miq. Flor. Ind. Bat. I, 198. *Dolichos trilobus* Linn. Mantiss. I, 101; Burm. Flor. Ind. 160, t. 50, f. 1; DC. Prodr. II, 399. *D. stipulaceus* Lamk, Encyc. Meth. II, 300.

Andamans; an introduced weed. Distrib. Northern Africa, S.-E. Asia, Malay Archipelago.

An annual crop and a perennial weed throughout its natural area. The perennial form has usually more deeply lobed leaflets; in the annual form lobed and entire leaflets are generally met with in varying proportions on the same plant. Though not as yet recorded from the Malay Peninsula proper, it may be expected to occur there as an introduced weed.

4. Phaseolus calcaratus Roxb. Hort. Beng. 54. A twining annual, or perennial with annual pubescent rarely glabrous stems 6–10 feet long,

rarely suberect with stems 1–2 feet high. *Leaves* usually 4–5 in. long; leaflets 3 membranous sparsely adpressed-pubescent on both surfaces, ovate to lanceolate, acute or shortly acuminate, entire or faintly repand rarely slightly lobed, base of terminal leaflet cuneate of lateral truncate or subauriculately lobed to outer side, 2–4 in. long, 1–2·5 in. wide; petioles 2–4 in. long, pubescent with spreading or slightly reversed hairs, petiolules ·15 in. long, pubescent, stipels ·15 in. long, glabrous lanceolate, stipules ·2–·25 in. long, lanceolate glabrescent. *Racemes* subspicate ·75–1·5 in. long, at end of stoutish peduncles 5–8 in. long, pubescent with at first decidedly reflexed hairs; flowers 2–3 together from 6–8 nodes at length ·2 in. apart, lower pedicels at length ·2 in. long, bracts lanceolate ·25 in. long fixed above the base. *Calyx* ·15 in. long teeth short deltoid, bracteoles narrowly lanceolate ·2 in. long. *Corolla* yellow ·5–·75 in. long, glabrous. *Pod* 2·5–3 in. long ·2 in. wide, recurved glabrous; *seeds* 10–12 subtruncate at ends with prominent hilum half as long as seed.

Var. *typica;* stems pubescent. Roxb. Flor. Ind. III, 289; Wall. Cat. 5611; W. & A. Prodr. 245; Bak. in Flor. Brit. Ind. II, 203. *P. hirtus* Wall. Cat. 5593 not of Retz. *P. sublobatus* Wall. Cat. 5598 not of Roxb. *P. pubescens* Blume Cat. Bog. 94; Miq. Flor. Ind. Bat. I, 200.

Perak; Batu Kuran, common, *Scortechini! Curtis* 2984! Andamans; common, cultivated and as an escape. Distrib. S.-E. Asia and Malaya.

Var. *gracilis;* stems slender, glabrous.

Perak; Larut, *Scortechini* 1476! *Wray* 1756! Goping, *Kunstler* 990! Durian, *Kunstler* 1035! 2467! Pahang; at Pekan, *Ridley* 1124! Distrib. Sumatra (*Forbes*).

But for the more slender and glabrous stems there is no character to separate var. *gracilis* from *P. calcaratus* which is otherwise a sufficiently variable species. Except that it is described as having subtorulose pods even when old, the writer would have no hesitation in referring *P. luteus* Bl. to var. *gracilis*. As a matter of fact the pods of all the varieties of *P. calcaratus* are subtorulose when young, and in Roxburgh's *P. torosus*, which is referable to *P. calcaratus*, they continue so; but, not having seen specimens, the writer does not feel justified in formally reducing Blume's plant, and would leave the matter to be settled by the botanists of the Dutch Indies.

5. Phaseolus Mungo Linn. Mantiss. I, 101. A spreading annual or perennial with slender annual pubescent stems 6–10 feet long, growing in open grassy places (*Kunstler*). *Leaves* 8–10 in. long; leaflets 3 blueish-green membranous ovate-acute, base wide-truncate—of lateral leaflets oblique, sparsely pubescent on both surfaces, 3–5 in. long, 2·5–4 in. wide, petioles 5 in. long sparsely pubescent with spreading hairs,

petiolules ·2 in. long densely pubescent, stipels slender subulate ·2 in. long, stipules lanceolate sparsely pubescent ·3 in. long. *Racemes* dense few-fld. at the end of sparsely pubescent peduncles 4 in. long, bracts lanceolate densely pubescent ·3 in. long, pedicels ·1 in. *Calyx* ·15 in. long puberulous externally, teeth triangular except the lowest lanceolate which is twice as long as the others and half as long as calyx-tube; bracteoles at base as long as bracts but rather narrower. *Corolla* bright yellow ·5 in. long glabrous. *Pods* ascending or almost erect, densely clothed with spreading hairs, 1·5–2 in. long, ·25 in. wide, compressed, 6–8 seeded. *Seeds* ·15 in. long, ·1 in. wide, dark brown, flat, oval, hilum one-third as long as seed not very prominent, dissipiment between seeds not pronounced. W. & A. Prodr. 245; Wall. Cat. 5889 in part only. *P. radiatus* Roxb. Hort. Beng. 54; Flor. Ind. III, 296; Miq. Flor. Ind. Bat. I, 197 in part, not of Linn. *P. Mungo* VAR. *radiatus* Bak. in Flor. Brit. Ind. II, 203.

PROV. WELLESLEY; at Prye Dock, *Curtis* 2211! PERAK; at Goping, *Kunstler* 946! DISTRIB. Wild in S.-E. Asia and also largely cultivated.

Very nearly related to *P. sublobatus* Roxb. (*P. trinervius* Heyne) which differs in having narrower pods, more distinct dissepiments between the much smaller seeds, and a rusty-red pubescence. This is the wild form of the plant cultivated in India as the *másh-kulai* or *urd* crop; though it happens to have been named *P. Mungo* by Linnæus it is quite distinct from the *Múng* plant which has spreading pods with smaller seeds and dark green leaves. The *Múng* is the species named *P. radiatus* by Linnæus.

9. VIGNA Savi.

Twining herbs or shrubs with pinnately 3-foliolate stipellate leaves. *Flowers* in copious axillary racemes bracteoles conspicuous. *Calyx* campanulate; teeth short or long, the upper often connate. *Corolla* much exserted; keel truncate or exserted not spirally twisted. *Stamens* diadelphous, anthers uniform. *Ovary* sessile many-ovuled; style long filiform, bearded along the inner face below the oblique stigma. *Pod* linear, subterete, subseptate. Species 40–50, mostly tropical; one widely cultivated.

Keel not prolonged into a beak; pods glabrous:—		
Stems trailing, pods short few-seeded; a wild sea-coast species	1.	*V. retusa.*
Stems suberect or twining, pods long very many-seeded; a widely cultivated plant	2.	*V. Catjang.*
Keel prolonged into a beak; pods pilose	3.	*V. pilosa.*

1. VIGNA RETUSA Walp. Rep. I, 778. An extensively spreading perennial trailing sea-coast species with glabrous stems. *Leaves* 3–4 in. long, leaflets 3, pale green, glabrous ovate to obovate thinly fleshy,

entire; apex obtuse or sometimes retuse base cuneate or rounded, 2 in. long, 1·5 in. wide; petiole 1·5 in., glabrous; petiolules ·15 in. sparsely hairy, stipels ·06 in. recurved lanceolate glabrous, stipules ·1 in. lanceolate basifixed. *Racemes* rather densely 12–20-fld. on peduncles 2–6 in. long, nodes 1–2-fld., the lowest ·15 in. apart; pedicels slender puberulous ·2 in. long, bracts ·15 in. long membranous ovate-lanceolate very early deciduous. *Calyx* campanulate faintly puberulous ·12 in. long teeth short deltoid. *Corolla* yellow, glabrous, ·5 in. long. *Pod* 1·5–2·5 in. long ·4 in. wide ·25 in. thick, glabrous subtorulose, seeds 4–8. *V. anomala* Walp. Rep. I. 779. *V. lutea* A. Gray in Bot. Wilkes Exped. I, 452; Bak. in Flor. Brit. Ind. II, 205. *Dolichos luteus* Sw. in Prodr. Veg. Ind. Occ. 105; DC. Prodr. II. 398. *Phaseolus obovatus* Grah. in Wall. Cat. 5609.

Andamans and Nicobars; common on all the coasts from the Coco group and Narcondam south to Katschall and Kamorta. Perak; *Scortechini! Ridley* 8011! Malacca; *Griffith!* A cosmopolitan littoral species.

2. Vigna Catjang Walp. in Linnæa XIII, 533. A suberect or twining annual with glabrous stems. *Leaves* 4–8 in. long; leaflets 3 membranous pale-green ovate-rhomboid entire or slightly lobed, apex acute base shortly wide-cuneate—of lateral leaflets obliquely, glabrous on both surfaces, 2·5 in. long by 1·75 in. wide or rather larger (var. *typica*) to 4 in. long by 3·5 in. or rather less (var. *sinensis*); petiole 1·5–4 in. long glabrous, petiolules ·15 in. long glabrous or puberulous; stipels ovate obtuse ·1 in., stipules ·3–·4 in. long attached above the base, membranous persistent ovate-lanceolate. *Racemes* subcapitately few-fld. on peduncles usually 1–4 in. long (var. *typica*) sometimes 8–12 in. long (var. *sinensis*); pedicels short (under ·1 in.), bracts membranous, fixed above base, deciduous. *Calyx* glabrous ·4 in., teeth deltoid-cuspidate one-third as long as tube. *Corolla* yellow, white, or pinkish ·75 in. long. *Pod* 4–24 in. long, ·3–·4 in. wide, scarcely depressed between the seeds; seeds 12–30 (in much elongated pods the spaces between the seeds are greatly widened). Bak. in Flor. Brit. Ind. II, 205.

Var. *typica*; suberect, leaves smaller and pods shorter. *V. Catjang* Walp.; Endl. ex Miq. Flor. Ind. Bat. I, 188. *Dolichos Catjang* Linn. Mantiss. 269; DC. Prodr. II, 399; Roxb. Hort. Beng. 55; Flor. Ind. III, 303; Wall. Cat. 5549.

Cultivated in most of the provinces.

Var. sinensis; twining, leaves larger and pods longer. *Vigna sinensis* Endl. ex Hassk. Pl. Jav. Rar. 386; Savi ex Miq. Flor. Ind. Bat. I, 187. *Dolichos sinensis* Linn. Cent. Pl. II, 28; Amoen. Acad. IV, 326; DC. Prodr. II, 399; Roxb. Hort. Beng. 55; Flor. Ind. III, 302;

Wall. Cat. 5550; Bot. Mag. t. 2232; W. & A. Prodr. 250. *D. tranquebaricus* Jacq. Hort. Vidob. III, t. 70; DC. Prodr. II, 400.

Cultivated in most of the provinces.

Widely cultivated in the Eastern Hemisphere; probably a native of S.-E. Asia, but apparently not now known in a truly wild state.

3. VIGNA PILOSA Bak. in Flor. Brit. Ind. II, 207. A slender twining perennial with hirsute stems. *Leaves* 5–8 in. long, leaflets 3, green, downy to subscabrid on both surfaces, entire ovate-acute 3–6 in. long, 1·5–2·5 in. wide, base truncate—of lateral leaflets unequally; petiole 2 in. long, closely downy, petiolules ·05 in. only, stipels subulate minute; stipules ·1 in. lanceolate caducous. *Racemes* many-fld. 2–3 in. long on peduncles ·5–2 in. long, nodes 1–2-fld. all close together in flower, at length ·15 in. apart, pedicels ·1 in. downy, bracts minute. *Calyx* campanulate oblique thinly silky, ·3 in. long, lower tooth lanceolate as long as tube one half exceeding the others. *Corolla* purple ·75 in. long. *Pod* 4–5 in. long, subcylindric ·25 in. in diam., densely hirsute with spreading hairs, septate within between the 8–12 subreniform shining black seeds with truncated ends, ·25 in. long ·15 in. wide. *Dolichos pilosus* Roxb. Hort. Beng. 55; Flor. Ind. III, 312; DC. Prodr. II, 397: W. & A. Prodr. 249. *Phaseolus difformis* Wall. Cat. 5599.

ANDAMANS; common, *King's Collectors!* DISTRIB. India and Indo-China.

10. PACHYRHIZUS Rich.

Wide-climbing herbs. *Leaves* pinnately 3-foliolate with stipellate lobed leaflets. *Racemes* long, with tumid nodes and fascicled pedicels; bracts and bracteoles setaceous, caducous. *Calyx* 2-lipped, the limb as long as the tube, the upper lip emarginate, the lower deeply 3-toothed. *Corolla* much exserted, the petals subequal; keel obtuse. *Stamens* diadelphous; anthers uniform. *Ovary* subsessile, many-ovuled; style long circinate at the apex, bearded down the inner side below the very oblique stigma. *Pod* large, linear, turgid, deeply depressed between the seeds. Species 2 or 3; the others Mexican and Angolan.

The oldest name for this genus is *Cacara* under which designation it was published by Thouars (*Dict. Sc. Nat.* V, 35) twenty years before Richard's name was issued.

PACHYRHIZUS ANGULATUS Rich. ex DC. Prodr. II, 402. A large strong climber with a tuberous root; stems stout, suffruticose, young stems and branches deciduously downy. *Leaves* 8–9 in. long, trifoliolate; leaflets large, membranous glabrous as broad as long base entire deltoid from middle of circumference anterior half deeply or shallowly lobed, 4 in. long, as much across; petiole 5–6 in. long glabrous, petiolules ·2 in.

long pubescent; stipels ·1 in. subulate, stipules lanceolate puberulous ·2 in. long. *Racemes* lax elongated 6–10 in. long on axillary peduncles 12 in. long and upwards, nodes 2–6-fld., lower sometimes 1 in. apart often produced into branches ·5 in. long; bracts lanceolate ·25 in. long silky. *Calyx* campanulate, teeth triangular nearly equalling tube, ·25 in. long, pedicels ·3 in. long, bracteoles setaceous silky shorter than calyx. *Corolla* purple 1 in. long. *Pod* at first adpressed-pubescent, at length almost glabrous 6–9 in. long ·5 in. wide, ·2 in. thick, deeply depressed along the valves between the 7–12 shining cinnamon-brown flattened seeds ·3 in. long, ·25 in. wide. Wall. Cat. 5526; W. & A. Prodr. 251; Miq. Flor. Ind. Bat. I, 191; Bak. in Flor. Brit. Ind. II, 207. *P. trilobus* DC. Prodr. II, 402. *Dolichos erosus* Linn. Sp. Pl. 726. *D. bulbosus* Linn. Sp. Pl., Ed. II, 1020; Roxb. Flor. Ind. III, 309. *D. trilobus* Lour. Flor. Cochinch. II, 535. *Cacara erosa* Kuntze Rev. Gen. Pl. I, 165.

Cultivated in most of the provinces. DISTRIB. Cosmopolitan in the tropics, probably originally American.

This is known, Mr. Curtis notes, as *Obie Songnang* in the Island of Penang. The large tuberous root, white outside and inside of the appearance and consistence of a turnip, is occasionally, according to Dr. Watt's *Dictionary of Economic Products*, 6–8 feet long and as thick as a man's thigh. It is eaten both cooked and uncooked, is palatable enough but rather insipid. If the rules as to priority of names be rigidly applied this must be known as *Cacara erosa* Kuntze.

11. DOLICHOS Linn.

Twining herbs with stipellate 3-foliolate leaves and minute subpersistent bracts bracteoles and stipules. *Flowers* racemose or axillary. *Calyx-tube* campanulate, teeth long or short. *Corolla* much exserted; its petals usually equal in length; keel obtuse or rostrate not spiral. *Stamens* diadelphous; anthers uniform. *Ovary* nearly sessile, many-ovuled; style thickened upwards and bearded down the inner edge or filiform and penicillate round the terminal stigma. *Pod* flat, linear or oblong, recurved. Species about 20, wide-spread in the tropics of both hemispheres.

The only species so far reported from the Malay Peninsula belongs to the group LABLAB, with a style thickened upwards from a narrow base, bearded down the inner edge. This group is treated by Baker as a subgenus, by Taubert as a section, of *Dolichos*. De Candolle, Wight & Arnott, and Kurz consider however, with Savi, that it would be preferable to deal with this as the type of a distinct genus *Lablab*.

DOLICHOS LABLAB Linn. Sp. Pl. 725. A tall subglabrous wide twining perennial or annual with round smooth or slightly downy stems. *Leaves* 4–12 in. long, 3-foliolate; leaflets entire ovate-acute, base cuneate or deltoid, rather pale green, glabrous or slightly pubescent beneath,

2–6 in. long and almost as broad; petiole 2–8 in. long, glabrous; petiolules ·2 in. long puberulous; stipels ·15 in. long subulate smooth; stipules lanceolate ·2 in. long basifixed. *Racemes* lax 6–9 in. long on peduncles 5–8 in. long; pedicels fascicled ·15–·25 in. long on nodes ·5–·75 in. apart; bracts early deciduous. *Calyx* ·2 in., teeth short deltoid, bracteoles oblong ·15–·2 in. *Corolla* white or pink ·6 in. long. *Pod* 1·5–2 in. long (in one rather unusual form 3 in. long) tipped with the hooked persistent base of the style. Bak. in Flor. Brit. Ind. II, 209.

Var. *typica;* pods longer, seeds with long axis along the pod. *D. Lablab* Linn. Sp. Pl. 725. *D. lignosus* Roxb. Flor. Ind. III, 305 not of Linn. *Lablab vulgaris* Savi, Diss. 19; DC. Prodr. II, 401; W. & A. Prodr. 250; Miq. Flor. Ind. Bat. I, 189. *D. cultratus* Forsk. Flor. Ægypt. Arab. 134.

Perak; cultivated, *Scortechini!* Andamans; cultivated, common. Cultivated everywhere in the tropics of the Old World.

Var. *lignosa;* pods shorter broader at the end, seeds with long axis across the pod. *D. lignosus* Linn. Sp. Pl. 726. *D. Lablab* Roxb. Flor. Ind. III, 307 not of Linn. *D. cultratus* Thunb. Trans. Linn. Soc. II, 320 not of Forsk. *Lablab cultratus* DC. Prodr. II, 402; W. & A. Prodr. 251; Miq. Flor. Ind. Bat. I, 190. *L. microcarpus* DC. Prodr. II, 402; Miq. Flor. Ind. Bat. I, 190.

Andamans; cultivated. Cultivated throughout south-eastern Asia.

In deference to the great authority of Mr. Baker these two very distinct plants are united specifically; they are however so different that they must be treated as at least separate varieties.

12. Psophocarpus Neck.

Twining herbs, with large tuberous roots. *Leaves* 3-foliolate, stipellate; stipules fastened above the base. *Flowers* rather large, lilac. *Calyx* teeth shorter than the tube, the two upper connate. *Corolla* much exserted, the petals equal in length; keel much incurved, but not beaked. *Stamens* monadelphous, the upper free downwards; anthers uniform. *Ovary* substipitate, many-ovuled; style long, much recurved, flattened laterally, densely bearded round the terminal stigma. *Pod* square, with a distinct wing to each angle, distinctly septate between the seeds. Species 3-4, all tropical in the Old World.

Psophocarpus tetragonolobus DC. Prodr. II, 403. A slender annual glabrous twiner with tuberous roots. *Leaves* 5–10 in. long; leaflets 3 ovate, acute or acuminate, base rounded or wide-cuneate, margin entire or slightly waved, glabrous, green above, paler sometimes slightly glaucescent beneath, 3–6 in. long, 2–6 in. wide; petiole 2–4 in.

glabrous, petiolules ·15 in. sparsely hairy along the sides; stipels lanceolate, glabrous ·1 in. long, stipules oblanceolate acute towards both ends from the almost median insertion, ·3 in. long, glabrous. *Racemes* lax 4–6 fld.; peduncles 2–6 in. long; pedicels geminate ·5 in. long, bracts small ovate, ·08 in long. *Calyx* campanulate glabrous oblique; upper connate teeth rounded emarginate, lateral oblong rather exceeding lowest; bracteoles 2 ovate, striate, glabrous, attached slightly above the base ·15 in. long twice as large as bracts, half as long as buds. *Corolla* blue or white 1·5 in. long. *Pod* 6–12 in. long, 1·35 in. wide, the wings along the angles membranous ·5 in. wide their margins crisped dentate and laciniate; seeds 8–16, rounded. W. & A. Prodr. 252; Hassk. Pl. Jav. Rar. 388 (VAR. *a.* only); Miq. Flor. Ind. Bat. I, 181 (VAR. *a.* only). *Dolichos tetragonolobus* Linn. Syst., Ed. X, 1162; Roxb. Flor. Ind. III, 305 (in part). *D. ovatus* Grah. in Wall. Cat. 5540.—Rumph. Herb. Amb. V. t. 133.

SINGAPORE; *Hullett* n. 75!

Cultivated throughout Southern Indo-China and Malaya.

13. CLITORIA Linn.

Scandent or suberect undershrubs, with showy flowers, 3–7-foliolate leaves, stipellate leaflets and persistent membranous small stipules and bracts and large bracteoles. *Calyx* membranous, tubular; teeth deltoid or lanceolate. *Corolla* much exserted; standard spoon-shaped, very large; wings and incurved keel much shorter. *Stamens* monadelphous or diadelphous; anthers uniform. *Ovary* stalked, many-ovuled; style incurved, flattened, bearded along the inner side. *Pod* linear, flattish or turgid. Species 27, in tropics of old and new world, mostly the latter.

Pod flattish, valves not keeled on the face (SUBGEN. *Ternatea*); stems scandent ... . 1. *C. Ternatea.*

Pod turgid, with a rib along face of valves (SUBGEN. *Neurocarpum*); stems suberect ... ... 2. *C. cajanifolia.*

1. CLITORIA TERNATEA Linn. Sp. Pl. 753. A climber with slender terete downy stems. *Leaves* 4 in. long, petiole ·75 in., rachis glabrous; leaflets terminal and in 2–3 opposite pairs ovate or oblong obtuse subcoriaceous; 1–2 in. long ·75–1 in. wide, stipules small ·2 in. long lanceolate, stipels minute linear. *Flowers* axillary solitary pedicels ·35–·5 in., bracteoles large roundish obtuse ·25–·5 in. long. *Calyx* ·5–·75 in.; teeth lanceolate nearly as long as tube. *Corolla* 1·5–2 in. long; standard 1 in. broad, bright blue with an orange centre or (in a commonly cultivated form) white. *Pod* flattish, valves smooth, 2–4 in. long, ·35 in. wide, sparsely hirsute; 6–10-seeded. DC. Prodr. II, 233; Bot. Mag. t. 1542; Roxb. Flor. Ind. III, 321; Wall. Cat. 5344; Miq. Flor. Ind. Bat. I, 226; Bak. in Flor. Brit. Ind. II, 208.

Andamans; commonly cultivated. Pangkore; *Scortechini!* Distrib.; common throughout the tropics in gardens and as an escape.

2. Clitoria cajanifolia Benth. in Mart. Flor. Brasil. XV, 121. A suberect undershrub with terete pilose branches. *Leaves* 2–3·5 in. long; petiole 1 in. and rachis adpressed-pilose; leaflets terminal and in 1 lateral pair lanceolate or oblanceolate obtuse subcoriaceous 2–5 in. long, ·75-1 in. wide, glabrous above, densely grey-canescent beneath; stipules shortly triangular, pubescent, stipels subulate. *Flowers* axillary usually 2 on a pubescent peduncle 1–1·5 in. long; bracteoles small ovate or lanceolate. *Calyx* ·75 in. long, teeth much shorter than tube. *Corolla* 1·5–2 in. long; standard 1·5 in. wide pale-violet with a dull-purple centre. *Pod* turgid, with a rib along face of valves, 1·25 in. long, ·35 in. wide quite glabrous, 5–7 seeded. Bak. in Flor. Brit. Ind. II, 209. *Neurocarpum cajanifolium* Presl. Symb. 17, t. 9; Miq. Flor. Ind. Bat. I, 225. *N. retusum* Hassk. Pl. Jav. Rar. 376. *Lotus fluminensis* Vell. Flor. Flum. VII, t. 132. (1835)

Malacca and Singapore, in old clearings, common. Distrib. A native of Brazil now naturalised in the localities mentioned, in Java, and in Siam.

14. Centrosema Benth.

Twining herbs or shrubs; stems with woody base. *Leaves* pinnately 3-foliolate, stipellate; stipules persistent basifixed. *Flowers* very large and showy with persistent bracts and large persistent bracteoles. *Calyx*-teeth short the upper pair connate or obsolete. *Corolla* much exserted; standard orbicular emarginate shortly spurred near base, longer than the falcate obovate wings and the broad incurved slightly shorter keel. *Stamens* usually diadelphous; anthers uniform. *Ovary* subsessile, many-ovuled, style incurved dilated at the apex, stigma terminal beardless. *Pod* subsessile linear flattened, 2-valved, slightly septate between the seeds, both sutures thickened and both valves strongly ridged along the face parallel to the sutures. Species about 25, all American.

Dr. Kuntze states (*Rev. Gen. Pl.* I, 163) that *Bradburya* Raf., reduced in the *Index Kewensis* to *Wistaria*, is in reality this genus, and that Rafinesque's description refers to *Centrosema virginianum* a species widely cultivated in Asia and now quite naturalized in Java though not yet reported as an escape in our area.

Centrosema Plumieri Benth. in Ann. Wien. Mus. II, 118. A large climber with woody base and twining slender firm glabrous or puberulous branches. *Leaves* 6–10 in. long; leaflets 3 papery dark green glabrous above puberulous on the nerves beneath broadly ovate acute or acuminate 3–6 in. long, 2·5–5 in. across; petioles 3–6 in., glabrous or puberu-

lous; petiolules ·15 in. pubescent; stipels ·25 in. long, lanceolate; stipules ovate-oblong persistent subscarious ·4 in. *Racemes* 2–6-fld., peduncles thick 1–2 in. long, pedicels usually geminate ·1–·15 in. long, bracts pubescent orbicular-cucullate as long as pedicels. *Calyx* ·25 in. long, oblique wide-campanulate glabrescent, upper tooth very short, lateral wide blunt, lower longer lanceolate, completely hidden by the large persistent coriaceous striate ovate obtuse bracts ·6–·75 in. long. *Corolla* large, standard 1·75 in. long, 1·5 in. wide, white, or white with crimson centre, pubescent externally; wings white tipped with violet or rose 1 in. long, ·5 in. wide; keel sometimes white, sometimes crimson. *Pod* 6 in. long, ·5 in. wide, straight, beaked by the persistent style 1 in. long, both sutures thickened, the lower with narrow longitudinal wings ·1 in. remote from the suture; seeds 10–12 oblong or subglobose, hilum oblong-linear. Mart. Flor. Bras. XV, I, 127. *Clitoria Plumieri* Juss. in Pers. Synops. II, 303; Edwards, Bot. Reg. IV, 268. *C. fluminensis* Vell. Flor. Flum. VII, 312, t. 128. *Cruminium giganteum* Desv. Ann. Sc. Nat. Ser. I, IX, 423.

Perak; at Kampar, *Curtis* 3140! Singapore; *Hullett* 57! 669! no doubt an escape from gardens, as it also is in Sumatra where it has been found growing in forests near Lampar (*Forbes* n. 2599!) A native of South America; cultivated in Asiatic gardens on account of its handsome flowers.

15. Teramnus Sw.

Twining herbs, of slender habit. *Calyx-tube* campanulate; teeth distinct, subequal or two upper not so long. *Corolla* little exserted; petals about equal in length; standard not spurred. *Stamens* monadelphous; alternate anthers small, abortive. *Ovary* sessile, many-ovuled; style short, curved, beardless, stigma capitate. *Pod* linear, hooked with the persistent style at the tip, flattish, septate between the seeds. Species 4, belting the world in the tropics.

Teramnus labialis Spreng. Syst. III, 235. A wide-spreading climber of slender habit with a few adpressed hairs on the stem. *Leaves* 2·5–4·5 in. long, petiole 1–1·5 in. sparsely adpressed-hirsute; leaflets 3 membranous or subcoriaceous ovate-oblong base rounded apex subacute or at times, especially of lateral pair, obtuse, terminal 1–2·5 in. long ·75–1·5 in. wide, lateral slightly smaller, green glabrescent above sparsely adpressed-hirsute beneath; stipules minute lanceolate deciduous ·15 in. long, stipels subulate ·1 in. *Inflorescence* of elongated lax axillary 8–12-fld. racemes 2–3 in. long; pedicels ·2 in. solitary below fascicled upwards, bracts narrowly lanceolate ·1 in. long, bracteoles close under calyx minute subulate. *Calyx* ·15–·2 in. long, 2-labiate, teeth subequal

lanceolate about as long as the narrowly campanulate tube. *Corolla* ·25 in. long reddish, standard emarginate, wings overarching the slightly shorter keel. *Pod* glabrous recurved linear 1·5–2 in. long, ·2 in. broad, 8–12 seeded. Benth. in Journ. Linn. Soc. VIII, 265; Bak. in Flor. Brit. Ind. II, 184. *Glycine labialis* Linn. fil. Suppl. 325; Roxb. Flor. Ind. III, 318; W. & A. Prodr. 208; Wight, Ic. t. 168; Miq. Flor. Ind. Bat. I, 222. *G. parviflora* DC. Prodr. II, 242; Wall. Cat. 5508 (excl. G., H.) *G. debilis* DC. Prodr. II, 242. *G. pallens* Grah. in Wall. Cat. 5518.

PENANG; *Wallich* 5518! DISTRIB. Throughout the tropics.

VAR. *mollis* Baker (*Teramnus mollis* Benth), should be looked for in the Malay Peninsula, for though it has not yet been reported from our area it occurs in Burma where it has been collected by Wallich and by Kurz, and again in Java where it appears to be commoner than *T. labialis* proper. It is distinguished from *T. labialis* by the presence of spreading hairs on the stem and by the pods being strigosely hirsute with long spreading hairs. Its leaflets also are densely pubescent beneath and its calyx-teeth are shorter than the tube.

16. DIOCLEA H. B. K.

Climbing shrubs. *Leaves* pinnately 3-foliolate, stipellate. *Flowers* blue or white, in elongated racemes with thickened nodes; bracts and bracteoles caducous. *Calyx*-tube campanulate, teeth shorter than tube, two upper quite connate. *Corolla* exserted; petals about equal in length; keel incurved but not beaked. *Stamens* monadelphous; the vexillary stamen free below connate with the others in the middle shorter than the rest and with a perfect anther; anthers of keel stamens (in Malay species) alternately perfect and abortive. *Ovary* subsessile hirsute, few-ovuled, style incurved beardless, stigma capitate. *Pod* oblong turgid 1–3-seeded, flattened along the upper suture. Species 17–18, one Indo-Malayan, one extending to Africa and America, the rest tropical American.

Leaflets glabrescent beneath, larger; flowers ·75 in. long; calyx teeth half as long as tube ... ... 1. *D. reflexa.*
Leaflets densely velvety beneath; flowers 1 in. long; calyx teeth wider one-third the length of tube ... ... 2. *D. javanica.*

1. DIOCLEA REFLEXA Hook. f. Niger Flora 306. A strong woody climber 20–30 feet long with rounded black early glabrescent branches. *Leaves* 3-foliolate 9 in. long; leaflets 3, dull green above paler beneath, subcoriaceous when young sparsely hairy on both surfaces but early becoming glabrous above and glabrous except for a few adpressed hairs on the nerves beneath, ovate shortly acuminate with subtruncate base 5 in. long 3 in. across, petiole 4 in. long channelled above sparingly adpressed hirsute; petiolules ·25 in. rusty pubescent, stipels ·2 in. long, subulate,

stipules lanceolate ·25 in. long, deciduous. *Inflorescence* in dense subspicate racemes 6 in. long on axillary peduncles 8–12 in. long with 2–3 widely separated empty bracts; rachis rusty-tomentose, flowers 2–3 together on rounded alternate nodes ·2–·25 in. apart; bracts ·5 in. long linear reflexed rusty-pubescent early deciduous. *Calyx* campanulate ·4 in. long with two small obtuse bracteoles at base; pedicels ·15 in. long rusty-puberulous; calyx teeth subequal except the broader truncate upper triangular, half as long as tube. *Corolla* pale-pink ·75 in. long, standard-limb orbicular emarginate. *Pods* few, 1–2-seeded; 3–4 in. long, 2 in. wide, ·5 in. thick along upper suture, at first sparsely adpressed rusty-silky at length glabrescent; seeds discoid dark brown 1·25 in. in diam. Bak. in Flor. Brit. Ind. II, 196. *Dolichos hexandra* Roxb. Hort. Beng. 55. *D. coriaceus* Grah. in Wall. Cat. 5562.

ANDAMANS; very common, *Helfer* 1752! *King's Collectors!* PENANG or SINGAPORE; *Wallich!* PERAK; Larut, *Kunstler* 5718! DISTRIB. Silhet; trop. Africa; trop. America.

The vexillary stamen in this and the next species is free at the base though not above; it is rather shorter than the others and bears a perfect anther; the anthers of the 9 stamens that constitute the keel-sheath are alternately perfect and abortive thus giving 5 perfect anthers on the sheath and a sixth perfect anther on the vexillary stamen; hence Roxburgh's excellent specific name.

Dr. Wallich did not obtain this species at Penang *and* Singapore; his note on the sheet of *Cat.* n. 5562 at Calcutta states that he had forgotten the precise locality but was of opinion that he obtained the specimen either at Penang *or* at Singapore.

2. DIOCLEA JAVANICA Benth. Pl. Jungh. 236. A rather slender woody climber 20–30 feet long with rounded black early glabrescent branches. *Leaves* 3-foliolate 6–7 in. long; leaflets dull green above, coriaceous, beneath densely rusty-velvety, ovate shortly acuminate with subtruncate base 4 in. long 2·25 in. across, petiole 2–3 in. long channelled above, rusty-velvety; petiolules ·25 in., velvety, stipels ·2 in. long subulate; stipules lanceolate ·25 in. long, deciduous. *Inflorescence* in dense subspicate racemes 6 in. long on axillary peduncles 8–12 in. long with 2–3 widely scattered empty bracts; rachis densely velvety, flowers 2–3 together on rounded alternate nodes ·2–·25 in. apart; bracts ·5 in. long linear reflexed rusty-pubescent early deciduous. *Calyx* campanulate ·5 in. long with two small obtuse bracteoles at base; pedicels ·15 in. long rusty-puberulous; calyx teeth subequal except the broader truncate upper wide triangular, one-third as long as tube. *Corolla* pale-pink 1 in. long, standard-limb orbicular. *Pods* few usually 1–2-sometimes 3-seeded; 3–5·5 in. long, 2 in. wide, ·5 in. thick along upper suture; at first densely rusty-tomentose at length glabrescent; seeds discoid 1·25 in. in diam. Miq. Flor. Ind. Bat. I, 217. *D. Fergusonii* Thwaites Enum. 412.

Perak; Larut, *Kunstler* 5196! 10320! *Wray* 2000! Malacca; *Maingay* 520! Distrib. Ceylon; Chittagong; Java.

Very nearly related to the preceding and perhaps only a form of that species. At the same time the characters by which they are separable are very constant in all the specimens of both that the writer has seen, and from the field-botanist's point of view, at least, it is just as well to follow Mr. Bentham in separating them.

17. Pueraria DC.

Twining shrubs or herbs with stipellate pinnately 3-foliolate leaves; leaflets sometimes palmately lobed. *Flowers* sometimes appearing before leaves, large or small, densely fascicled, in long often compound racemes. *Calyx* teeth long or short the two upper connate. *Corolla* distinctly exserted; standard usually spurred at the base equalling in length the obtuse wings and keel. *Stamens* more or less thoroughly monadelphous; anthers uniform. *Ovary* sessile or nearly so, many-ovuled; style filiform much incurved beardless, stigma capitate. *Pod* linear, flattish. Species about 12, mostly Indo-Chinese.

1. Pueraria phaseoloides Benth. in Journ. Linn. Soc. IX, 125. A slender creeper 20–30 feet long with adpressed-pubescent slender hardly woody stems, and slender twining branches clothed with spreading greyish-brown hairs. *Leaves* contemporaneous with flowers, 6–8 in. long; leaflets 3, membranous dull-green thinly adpressed-hirsute above, dark greenish-grey and densely velvety-tomentose beneath, triangular ovate base wide cuneate—of lateral pair obliquely, apex subobtuse margin entire repand or slightly 3-lobed, sub-3-nerved at base, 3–4 in. long, 2–3 in. wide, petiole 3–4 in., densely clothed with spreading hairs, petiolules ·2 in. long; stipels small subulate weak ·1 in. long, stipules small lanceolate basifixed. *Inflorescence* of long-peduncled axillary racemes of fascicled flowers; peduncle 6–8 in. and rachis puberulous; racemes 4 in. long, fascicles ·25–·5 in. apart 4–5-fld., pedicels ·2 in. puberulous, bracts and bracteoles lanceolate rather rigid clothed with adpressed bristly hairs, the bracteoles subpersistent. *Calyx* campanulate ·25 in. long clothed with adpressed bristly hairs, teeth unequal upper broad, and lower lanceolate as long as tube and one-third larger than lateral triangular, all setaceous at tip. *Corolla* pale-blue and white, ·6 in. long, standard-limb suborbicular distinctly spurred. *Pods* numerous, at first puberulous, at length glabrescent slightly recurved at the tip, 3·5 in. long only ·2 in. wide. *Seeds* about 16, ·15 in. long ·1 in. wide, truncate at ends, dark brown, testa dull minutely rugulose. Bak. in Flor. Brit. Ind. II, 199 (excl. syn. *P. subspicata* Bth.). *Dolichos phaseoloides* Roxb. Flor. Ind. III, 316. *D. viridis* Ham. in Wall. Cat. 5559. *Neustanthus phaseoloides* Benth. Pl. Jungh. 235; Miq. Flor. Ind. Bat. I, 219. *Phaseolus decurvus* Grah. in Wall. Cat. 5612.

ANDAMANS; at Port Blair, *Prain!* PENANG; *Wallich* 5612! PERAK; Goping, *Kunstler* 1062! 2456! 5117! *Scortechini* 591! 1441! Ipoh, *Curtis* 3151! DISTRIB. S.-E. Asia.

18. CANAVALIA DC.

Large twining perennials or biennials with stipellate pinnately 3-foliolate leaves and showy flowers. *Calyx* deeply tubular, limb 2-labiate, the upper lip projecting, entire or emarginate the lower shortly 3-toothed. *Corolla* far exserted; standard large roundish; wings shorter equalling the incurved obtuse keel. *Stamens* monadelphous; anthers uniform. *Ovary* obscurely stalked many-ovuled; style incurved beardless, stigma terminal. *Pod* large linear or oblong, flat or turgid with a longitudinal ridge along each margin of the flattened upper suture. Species 10–12, mostly American.

Pods not turgid, deeply double-channelled along the dorsal suture:—
- Pods 1·5–2 in. across; flowers many ... ... 1. *C. ensiformis.*
- Pods ·5–·75 in. across; flowers few ... ... 2. *C. lineata.*

Pods turgid, almost flat along the dorsal suture; endocarp separating ... ... 3. *C. obtusifolia.*

1. CANAVALIA ENSIFORMIS DC. Prodr. II, 404. A large biennial or perennial climber with glabrous stems and branches. *Leaves* 3-foliolate 10–12 in. long; leaflets green paler beneath, membranous, when young puberulous, very soon quite glabrous ovate-acute, base rounded—in lateral pair slightly obliquely; 5–6 in. long, 2·5–4 in. wide; petiole 6 in. long glabrous, petiolules ·25 in.; stipels ·15 in. subulate very early deciduous; stipules small triangular ·1 in. long, caducous. *Inflorescence* in lax 12–20-fld. racemes 3–8 in. long on axillary peduncles 4–6 in. long; flowers solitary or geminate from swollen nodes ·3–·5 in. apart, pedicels ·1–·15 in., bracteoles minute ovate caducous. *Calyx* campanulate, sparsely puberulous reticulate-veined ·6 in. long, upper lip oblong emarginate one-third the length of tube. *Corolla* lilac or white 1·5 in. long, limb of standard orbicular emarginate. *Pods* few, long, linear-oblong, slightly curved, dorsal suture strongly 3-keeled and deeply 2-grooved between the keels, 5–20-seeded, in length varying from 6–24 inches, in depth from 1·5–2 in., distance between outer ridges of dorsal suture ·5 in. *Seeds* white, grey or more usually red, 1·25 in. long, ·75 in. wide. Bak. in Flor. Brit. Ind. II, 195. *C. gladiata* DC. Prodr. II, 404; Wall. Cat. 5531; W. & A. Prodr. 253; Miq. Flor. Ind. Bat. I, 216. *Dolichos ensiformis* Linn. Sp. Pl. 725. *D. gladiatus* Jacq. Coll. II, 276; Roxb. Hort. Beng. III, 300.

In some of the provinces, cultivated; as it almost universally is throughout the tropics.

The writer follows Mr. Baker in identifying the American *Dolichos gladiatus* (*Canavalia gladiata* DC.) with the Asiatic *Dolichos ensiformis* (*Canavalia ensiformis* DC.)

2. CANAVALIA LINEATA DC. Prodr. II, 404. A glabrous perennial on rocky or sandy sea-coasts. *Leaves* 3-foliolate 8–9 in. long; leaflets pale-green thickly membranous ovate or orbicular, obtuse with or without a short point, or retuse, base cuneate, 2–3 in. long and 2–3 in. across; petiole 3–5 in. long somewhat fleshy, glabrous; petiolules .25 in., stipels ·15 in. subulate very early deciduous; stipules small triangular ·1 in. long caducous. *Inflorescence* in long-peduncled 4–8-fld. racemes on peduncles 10–16 in. long; flowers solitary or geminate from swollen nodes ·3–·5 in. apart, pedicels ·1–·15 in. bracteoles minute ovate caducous. *Calyx* campanulate sparsely puberulous reticulate-veined ·6 in. long, upper lip oblong subentire one-fourth the length of tube. *Corolla* violet 1 in. long, limb of standard orbicular emarginate. *Pods* few, short, linear-oblong, straight, dorsal suture strongly 3-keeled and deeply 2-grooved between the keels, 4–6-seeded, 3–5 in. long, ·75 in. deep; width between outer ridges of dorsal suture ·3 in. *Seeds* dark-brown · 5 in. long. Somoko-Dusets XIII, t. 20. *Dolichos lineatus* Thunbg. Flor. Japon. 280. *D. obcordatus* Roxb. Flor. Ind. III, 303. *Canavalia obtusifolia* Bak. in Flor. Brit. Ind. II, 196, not of DC; Cleghorn, Madr. Journ. (n. s.) I, t. 4.

PAHANG; Sungei Kelang, *Ridley!* PENANG; common on sand-banks along the coast, *Curtis* 1714! SINGAPORE; *Hullett* 514! DISTRIB. Coasts of India, Indo-China, Malaya, China, Japan, Polynesia, Australia.

3. CANAVALIA OBTUSIFOLIA DC. Prodr. II, 404. A large biennial climber with glabrous stems and branches. *Leaves* 3-foliolate 10–12 in. long; leaflets green, membranous, when young puberulous very soon quite glabrous, ovate-acute to rounded with a shortly acuminate tip, base rounded to subtruncate; 5–6 in. long 3·5–4·5 in. wide; petiole 6 in. long, glabrous; petiolules ·25 in.; stipels ·15 in. subulate, very early deciduous; stipules small triangular ·1 in. long, caducous. *Inflorescence* in lax 12-16-fld. racemes 3–8 in. long, on axillary peduncles 6–12 in. long; flowers solitary or geminate from swollen nodes ·3–·5 in. apart, pedicels ·1–·15. in., bracteoles minute ovate caducous. *Calyx* campanulate, sparsely puberulous, faintly ridged and not very distinctly reticulate-veined, ·5 in. long, upper lip rounded hardly emarginate, scarcely longer than lower and not one-sixth the length of tube. *Corolla* blue and white, 1 in long, limb of standard orbicular slightly emarginate. *Pods* few, short, turgid, slightly curved, dorsal suture faintly 3-keeled, spaces between keels wide and plane, not grooved, 3–6-seeded, length 3–5 in., depth 1·75–2·25 in., width of dorsal suture between outer keels ·75 in. *Seeds* pale umber with gamboge streaks, ·75 in. long ·5 in. broad,

embedded in the woolly separable endocarp. Miq. Flor. Ind. Bat. I, 215. *C. turgida* Grah. in Wall. Cat. n. 5534 A; Miq. in Flor. Ind. Bat. I, 215. *C. ensiformis* VAR. *turgida* Bak. in Flor. Brit. Ind. II, 196. *Dolichos obtusifolius* Lamk. Encyc. Meth. II, 295. *D. rotundifolius* Vahl, Symb. II, 81; Roxb. Flor. Ind. III, 302.—Rheede Hort. Malab. VIII, t. 43; Pluken. Almag. t. 51, f. 2.

ANDAMANS; Coco Group and Narcondam, *Prain!* Mid. Andaman, *Kurz!* S. Andaman, *Kurz! Man! King's Collector!* Little Andaman, *Prain!* PERAK; *Scortechini* 1391! *Kunstler* 1123! PANGKORE; *Scortechini* 978! PENANG; *Wallich* 5534! SINGAPORE; Pulo Obin, *Hullett* 330! DISTRIB. Indian, Indo-Chinese and Malayan coasts.

There is no doubt that, in the first place, this is *C. obtusifolia* DC.; that, in the second place, it is not *C. obtusifolia* Bak., in *Flor. Brit. Ind.*; and that, finally, it is specifically distinct from *C. ensiformis* of which the *Flora* makes it a variety. It is however, particularly unfortunate that, while the leaflets of *C. lineata* are almost always "obtuse," those of *C. obtusifolia* rarely are.

19. MUCUNA Adans.

Perennials and annuals of wide-twining habit. *Leaves* ample, stipellate, always 3-foliolate. *Flowers* large, showy, usually dark purple, turning quite black when dried. *Calyx-tube* campanulate; two upper teeth quite connate; lowest longer than the middle ones. *Corolla* much exserted; standard not more than half as long as the rostrate keel, which usually a little exceeds the wings. *Stamens* diadelphous; anthers dimorphous, like those of the *Genisteæ*. *Ovary* sessile, many-ovuled; style incurved, beardless, stigma capitate. *Pod* very variable in shape and sculpture, usually covered with brittle needle-like irritating bristles. Species about 30, spread everywhere in the tropics.

Perennials; pods flat, seeds large flattened, with a hilum extending round the greater part of their periphery (Subgen. ZOOPHTHALMUM):—

Pods with plaits across their faces (§ *Citta*):—

Racemes long lax simple, bracts large boat-shaped; pods with broad wings, over which the plaits do not extend, down the sutures ... ... 1. *M. imbricata.*

Racemes short corymbose, bracts small; pods with transverse plaits that extend across the usually narrower sutural wings:—

Peduncles naked at base; bracteoles longer than buds; calyx-teeth long; pods one-seeded; margins of transverse plaits simple, and of sutural wings entire 2. *M. monosperma.*

Peduncles bracteate at base; bracteoles shorter than buds; calyx-teeth very short; pods two-seeded; margins of plaits 2-plicate, and of sutural wings incised ... ... 3. *M. biplicata.*

Pods without plaits across their faces (§ *Carpopogon*); (wide-winged down both sutures):—		
Racemes short corymbose, bracts large boat-shaped ...	4.	*M. acuminata.*
Racemes long-peduncled, umbelliform, bracts minute...	5.	*M. gigantea.*
Annuals; pods turgid, hooked; seeds small oval with small lateral hilum (Subgen. STIZOLOBIUM)	6.	*M. pruriens.*

SUBGEN. 1. ZOOPHTHALMUM. Perennial climbers; seeds large more or less flattened, with a long hilum extending round the greater part of the periphery.

§ CITTA. Pods plaited across their faces.

1. MUCUNA IMBRICATA DC. Prodr. II, 406. A large woody climber with slender glabrescent branches. *Leaves* 9–15 in. long; leaflets 3, membranous, green, glabrous above, glabrous or with a few adpressed hairs beneath, ovate-oblong cuspidate, base rounded—of lateral leaflets obliquely, 5–7 in. long, 3–3·5 in. across, petiole glabrous 4–8 in. long, petiolules ·2 in., stipels subulate ·15 in.; stipules linear ·25 in. long. *Inflorescence* of lax 8–10-fld. axillary racemes, pedicels ·35 in. long 1–3 together from swollen nodes towards upper third to fourth of peduncle 5–15 in. long, and in the axils of large boat-shaped deciduous bracts 1·25 in. long 1 in. wide glabrous on both surfaces rounded at apex except the acute or subacute lowest, forming at first a strobilate head. *Calyx* ·75 in. long sparsely covered externally with brown deciduous irritating bristles, tube wide-campanulate hardly longer than the wide triangular teeth; flower-buds with a bracteole similar to bracts but much smaller and more early deciduous, at base of calyx. *Corolla* 2–2·25 in. long dull purple or white with purple spots; keel abruptly inflexed at tip standard 1 in. across 1·25 in. long; wings ·5 in. wide. *Pod* oblong 4·5–6 in. long 2·25 in. across, wings along the sutures ·5 in. wide, plaits ·35 in. deep hardly crossing the wings; clothed in all parts with brown deciduous bristles; seeds 2–3. Bak. in Flor. Brit. Ind. II, 185. *Citta nigricans* Lour. Flor. Cochinchin. 557. *Carpopogon imbricatum* Roxb. Hort. Beng. 54. *Stizolobium imbricatum* Kuntze Rev. Gen. Plant. I, 208. *Zoophthalmum nigricans* Prain MSS.

ANDAMANS; in the interior forests, common. DISTRIB. Himalayas from Kamaon, eastward; and throughout Indo-China.

Most nearly related, amongst Malayan species, to *Stizolobium Junghuhnianum* Kuntze (*Rev. Gen.* Plant. I, 208) from Java, which has very similar bracts. The pods, however, are in that species slightly narrower with rather narrower wings across which the plaits extend more completely. The branches, petioles, leaves and bracts of *M. Junghuhniana* are moreover strigosely hispid and the calyx and pods are more densely bristly. Nearly related also is *M. cyanosperma* K. Schum., from the Moluccas.

2. Mucuna monosperma DC. Prodr. II, 406. A large woody climber with deciduous rusty down on young branches. *Leaves* 6–9 in. long; leaflets 3 thinly subcoriaceous green glabrous above, when young rather closely rusty-downy beneath, ovate-oblong cuspidate base rounded —of lateral leaflets obliquely, 3–4 in. long 2–2·25 in. across, petiole 3–5 in. long at first rusty, soon glabrescent; petiolules ·25 in., stipels subulate ·15 in.; stipules linear ·2 in. *Inflorescence* corymbose 6–12-fld., axillary, peduncles usually ·5–1 in. occasionally elongated 2·5–3 in. long, at first rusty-puberulous as are the pedicels ·25–·5 in. long; bracteoles at base of calyx lanceolate ·6 in. long, exceeding the buds; bracts small triangular ·15 long very early deciduous and leaving small scars at base of pedicels. *Calyx* ·4 in. long densely covered with pungent deciduous bristles, tube campanulate twice as long as unequal teeth; upper tooth truncate lateral deltoid lower linear. *Corolla* 1·5 in. long, purple; keel abruptly inflexed at tip, wings ·25 in., standard ·6 in. long ·5 in. wide. *Pod* 2·75 in. long 2·25 in. wide broadly oblong, wings along the dorsal sutures ·5 in. wide along ventral ·25 in., plaits ·3 in. high crossing the wings to their margins; clothed in all parts with brown deciduous bristles; seeds solitary. Wight in Hook. Bot. Misc. II, 346, Suppl. t. 12; W. & A. Prodr. 254; Miq. Flor. Ind. Bat. I, 214; Bak. in Flor. Brit. Ind. II, 185. *M. anguina* Wall. Pl. As. Rar. III, 19 t. 236. *Carpopogon monospermum* Roxb. Hort. Beng. 54; Flor. Ind. III, 283. *C. anguineum* Roxb. Hort. Beng. 54. *Zoophthalmum monospermum* Prain MSS.

Andamans; everywhere very common in the interior jungle.

3. Mucuna biplicata Teysm. & Binnend. Cat. Hort. Bog. 261. A large woody climber 30–40 feet long with slender glabrous branches. *Leaves* 9–12 in. long; leaflets 3, chartaceous dull green, glabrous on both surfaces ovate-oblong, cuspidate, base rounded—of lateral leaflets obliquely, 6–8 in. long, 5 in. across, petiole glabrous 4–6 in. long, petiolules ·25 in., stipels subulate ·15 in. long; stipules linear ·2 in.; pulvinus swollen puberulous. *Inflorescence* corymbose axillary 2 in. long; peduncle rusty-pubescent arising from an axillary node, its neck surrounded by a number of small triangular acute scaly bracts ·15 in. long emitting at once 1–4 3–6-fld. branches 1–5 in. long, main rachis corymbosely branched or simple 15–18-fld., bracts at base of pedicels small triangular immediately deciduous; pedicels ·2 in. long; bracteoles at base of calyx ·2 in. long, oblong much shorter than buds. *Calyx* greenish-brown densely covered with deciduous pungent bristles, ·35 in. long, tube wide-campanulate, teeth extremely short. *Corolla* dark-purple 1·75 in. long; keel abruptly inflexed at tip, wings 1·25 in. long, standard ·75 in. wide. *Pod* hardly stipitate 3·5 in. long 1·75 in. wide; plaits oblique very close-set their

edges double with reflexed margins, covered with close pungent brown bristly pubescence; marginal wings lobed between the plaits. *M. atropurpurea* Bak. in Flor. Brit. Ind. II. 186 in part and as to the Malacca plant only. *M. anguina* Scheff. Nat. Tijd. Ned. Ind. XXXII. 413 not of Wall. *Zoophthalmum biplicatum* Prain MSS.

Malacca; *Maingay*, 590. Penang; Gapis Pass, *Curtis* 2989! Perak; Ulu Kewanta, *Scortechini* 925! Sunga Ryah, etc. *Kunstler* 868! 3915! 6805! 8330! *Wray* 3746! Distrib. Sumatra (*Forbes* 2649!) Borneo.

There are at Calcutta both flowering and fruiting examples of Teysmann and Binnendyk's original species cultivated in the Buitenzorg garden; these are identical in every detail with this common Sumatra and Malay Peninsula plant. The pods much resemble those of *M. atropurpurea*, to which it comes nearest and with which it has been identified by Mr. Baker. But, besides the double edge to the plaits on the pods, whence the name, the Malayan differs from the Indian species in having larger leaflets, shorter inflorescences, a calyx with an almost truncate mouth and a collar of scaly bracts at the neck of the peduncle similar to but smaller than those that occur at the base of the peduncle in *M. bracteata* of the subgenus *Stizolobium*.

§ Carpopogon. Pods not plaited across their faces.

4. Mucuna acuminata Grah. in Wall. Cat. 5621. A slender creeper 20–30 feet long with sparingly adpressed-puberulous branches. *Leaves* 6–10 in. long; leaflets 3, membranous dull green glabrous above sparingly puberulous especially on the nerves beneath, ovate-oblong rather abruptly acuminate, base rounded or subtruncate—of lateral leaflets obliquely, 2·5–4 in. long 2–3·5 in. wide, petiole glabrous, 4–6 in. long; petiolules ·25 in. adpressed-puberulous; stipels subulate ·15 in. long, stipules linear ·2 in. *Inflorescence* when young in strobilate heads, corymbose, axillary, 2–3 in. long, peduncle grey-pubescent arising from an axillary node, its neck with a collar of small triangular acute scaly bracts ·15 in. long emitting at once 1–4 4–8-fld. usually bifurcate branches; bracts at base of pedicels deciduous large boat-shaped externally finely grey-pubescent, ·75 in. long, ·5 in. wide; pedicels grey-pubescent at length ·4–·6 in., bracteoles at base of calyx ·3 in. long, deciduous, lanceolate, as long as buds. *Calyx* glossy pale-brown densely covered with deciduous pungent bristles, ·5 in. long, tube wide campanulate twice as long as unequal teeth; upper tooth truncate, lateral wide-deltoid, lower linear longer than the others. *Corolla* 1·75–2 in. long, keel not abruptly inflexed at tip; wings as long as keel and twice as long as the standard ·7 in. wide. *Pod* not quite ripe, 3 in. long, 1·5 in. across, broadly winged down both sutures but not plaited on the faces, copiously clothed especially along the wings with deciduous yellow-brown irritating bristles; seeds 3. *Zoophthalmum acuminatum* Prain MSS.

Penang; *Wallich* (Cat. n. 5621)! Perak; Kinta, *Kunstler* 7038! Singapore; Chan Chu Kang, *Ridley* 2075! Distrib. Java (*Forbes* n. 493!)

5. Mucuna gigantea DC. Prodr. II, 405. A long very slender climber sometimes reaching 250 feet! with slender glabrous branches. *Leaves* 5–9 in. long; leaflets 3, subcoriaceous dark green, dull, glabrous on both surfaces; oblong cuspidate, base of terminal cuneate of lateral obliquely rounded, 4–5 in. long, 2·5 in wide, petiole glabrous 5 in. long; stipels subulate ·15 in., stipules linear ·2 in. long. *Inflorescence* a pendulous umbelliform corymb terminating a slender glabrous peduncle 4–18 in. long and bearing near its apex usually 3 sometimes 5–7 small projecting puberulous nodes each emitting 3–5 slender readily disarticulating grey-pubescent pedicels ·75 in. long; bracts and bracteoles both minute and very early deciduous. *Calyx* ·5 in. long green with a few pungent bristles, tube rather cylindric ·5 in. across, teeth all very short the upper wide subtruncate, the other three in bud shortly triangular at length obsolete. *Corolla* sickly greenish-yellow or white 1·25–1·5 in. long, keel not abruptly inflexed at tip; wings 1–1·25 in., standard ·75 in. long ·6 in. wide. *Pod* broadly winged down both sutures faces smooth or with oblique cross ridges but never distinct plaits; 3·5–6 in. long, 2 in. across, clothed with deciduous yellow-brown irritating bristles; seeds 2–4. Wall. Cat. 5619; W. & A. Prodr. 254; Wight in Hook. Bot. Misc. II, 351, Suppl. t. 14; Miq. Flor. Ind. Bat. I, 213; Bak. in Flor. Brit. Ind. II, 186. *M. corymbosa* Grah. in. Wall. Cat. 5622. *Dolichos giganteus* Willd. Sp. Pl. III, 1041. *Carpopogon giganteum* Roxb. Hort. Beng. 54; Flor. Ind. III, 286. *Stizolobium giganteum* Kuntze Rev. Gen. Plant. I, 208. *Zoophthalmum giganteum* Prain MSS.

Andamans; Coco Group, *Prain!* Middle Andaman, *Kurz!* South Andaman, *Liebig! Kurz! Man!* Little Andaman, *Prain!* always close to salt-water creeks or in Mangrove-swamps. Narcondam, near sea beach, *Prain!* Perak; *Scortechini!* Pahang; *Ridley* 1227! Distrib. A littoral species on Indian, Indo-Chinese, Malayan and Polynesian Coasts.

Subgen. 2. Stizolobium. Annual climbers; seeds ovoid with a small lateral hilum.

6. Mucuna pruriens DC. Prodr. II, 405. A slender annual climber with adpressed-pubescent branches at length glabrescent. *Leaves* 6–9 in. long; leaflets 3, membranous ovate-rhomboid, green glabrescent above grey-silky and lustrous beneath, the lateral pair very oblique truncate at base, all 3–5 in. long 2–3 in. wide; petioles 2·5–4·5 in. long, adpressed silky, petiolules ·2 in. long, stipels ·15 in. long subulate, stipules lanceolate ·2 in. long. *Inflorescence* of short-peduncled racemes varying from 1 in. to 1 foot in length and from 3–30-fld., drooping, rachis

finely silky, pedicels short ·15–·25 in. usually solitary from lateral projecting nodes; bracts ·5 and bracteoles ·3 in. lanceolate, grey-silky, lustrous. *Calyx* ·4 in. long with a few pungent bristles, tube campanulate hardly as long as the lower lanceolate tooth and equalling the lateral lanceolate and upper triangular tooth. *Corolla* purple 1·25–1·5 in. long; keel slightly incurved, wings nearly as long, standard ·6 in. long and about as broad. *Pod* 2–3 in. long ·5 in. wide, turgid, ridged longitudinally, recurved in the lower half and abruptly hooked at the tip; clothed with dense, intensely pungent subpersistent bristles at first dark purplish brown at length steel grey to pale rusty-brown; seeds 5–6. Wall. Cat. 5616; Wight in Hook. Bot. Misc. II, Suppl. t. 13.; Bak. in Flor. Brit. Ind. II, 187. *M. prurita* Hook. Bot. Misc. II, 348; W. & A. Prodr. 255; Miq. Flor. Ind. Bat. I, 211. *M. utilis* Wall. ex Wight Ic. t. 280. *Dolichos pruriens* Linn. Syst. Ed. X, 1162. *Stizolobium pruriens* Pers. Synops. II, 299; Kuntze Rev. Gen. Plant. I, 208, *Carpopogon pruriens* Roxb. Hort. Beng. 54; Flor. Ind. III, 283.

Andamans: Great Coco, near N. Andaman, common, *Prain!* Perak; Kampong Kota, *Wray* 3326! Distrib. Throughout the tropics.

20. Strongylodon Vogel.

Twining herbs, with firm stems and with stipellate 3-foliolate leaves *Flowers* in long lax racemes. *Calyx* campanulate, gibbous; teeth short, obtuse, imbricated. *Corolla* much exserted; standard lanceolate, recurved; wings obtuse, more than a third as long; keel curved, as long as the standard, narrowed into a long beak. *Stamens* diadelphous anthers uniform. *Ovary* stalked, few-ovuled, style filiform beardless; stigma capitate. *Pod* oblong, turgid. *Seeds* as large as a bean, with a hilum running more than half round. Species 3, Polynesian.

Strongylodon ruber Vogel, Linnæa X, 585. An extensive climber with quite glabrous thin hollow but firm stems. *Leaves* 8 in. long, petioles 2 in. long glabrous; leaflets 3, bright green, glabrous on both surfaces membranous shining above, ovate, shortly bluntly cuspidate subequal, 4 in. long 2·5 in. wide, terminal rounded at base with petiolule 1 in., lateral obliquely cuneate at base with short petiolules; 3-nerved at base, central nerve with 2–3 pairs of arching lateral nerves all visible beneath; stipels lanceolate membranous ·15 in. long, stipules triangular ·25 in. long membranous. *Inflorescence* in copious axillary racemes with peduncles 4–6 in. long of 30–40 1–3 fld. fascicles of pedicellate flowers arising from small produced nodes with obsolete bracts; pedicels slender spreading, ·5–·75 in. long. *Calyx* glabrous ·3 in. long tubular; teeth very short rounded; 2-bracteolate at base, bracteoles caducous. *Corolla* bright-red 1 in. long, standard lanceolate acute, the short obtuse wings

intimately attached to lamina of narrowly-lanceolate curved keel. *Pod* oblong 3 in. long, obliquely pointed, distinctly stalked, 2 seeded. Walp. Ann. IV, 559; A. Gray, Bot. Amer. Explor. Exped. 446 t. 48; Thwaites Enum. 89; Bak. in Flor. Brit. Ind. II, 191. *Rhynchosia lucida* DC. Prodr. II, 389.

Andamans; common, *Prain! King's Collectors!* Distrib. Ceylon; Polynesia.

21. Erythrina Linn.

Trees with prickly branches. *Flowers* large, coral-red, in dense racemes, produced usually before the development of the large constantly 3-foliolate leaves. *Calyx* oblique, spathaceous, finally slitting down to the base or campanulate-bilabiate. *Petals* very unequal; standard always much exserted and considerably exceeding the keel and wings. Upper *stamen* free down nearly to the base or connate with the others half way up the filaments; anthers uniform. *Ovary* stalked, many-ovuled; style incurved, beardless; stigma capitate. *Pod* linear, fertile turgid and torulose throughout, or flat and seedless below. Species 25–30, principally tropical, in both the New World and the Old, and at the Cape.

Pods turgid and seed-bearing throughout their length; stipels replaced by ovate-glands as long as broad; seeds with a very large oval hilum:—	
Calyx spathaceous, oblique not at all 2-lipped, splitting to the base down the back (§ *Stenotropis*); leaflets membranous subreniform or triangular, green on both surfaces; flowers narrow, standard entire at apex ...	1. *E. indica.*
Calyx campanulate, somewhat 2-lipped, not splitting to the base (§ *Micropteryx*); leaflets subcoriaceous ovate-oblong, glaucous beneath; flowers broad, standard emarginate	2. *E. ovalifolia.*
Pods flat, seedless and indehiscent in their lower half (§ *Hypaphorus*); stipels replaced by oblong glands longer than broad; seeds with a small hilum; (calyx somewhat 2-lipped; leaves membranous ovate-acute, green on both surfaces; flowers narrow, standard entire at tip)	3. *E. lithosperma.*

Subgen. 1. Stenotropis Hassk. *Calyx* spathaceous, oblique not at all 2-lipped, finally split to the base down the back. *Pod* turgid and seed-bearing throughout.

1. Erythrina indica Lamk Encyc. Meth. II, 391. A tree 60 feet high with thin grey bark, armed with minute conical dark-brown prickles. *Leaves* 8–12 in. long; petioles 4–6 in. long unarmed, when young densely brownish-grey puberulous when full-grown glabrescent

especially in the upper half; leaflets 3, membranous, uniformly bright green, densely brownish-grey puberulous when young when full-grown quite glabrous, terminal subreniform lateral pair slightly oblique triangular, all subcuspidate at apex and subtruncate at base, 4–6 in. long, terminal rather broader than, lateral hardly so broad as long; petiolules ·3-·4 in. long; stipels represented by ovate glands ·1 in. diam. that remain attached to the rachis on the fall of the leaflets; stipules flaccid lanceolate ·4 in. long softly brown-puberulous early caducous. *Inflorescence* of dense racemes 4–6 in. long on stout spreading woody peduncles 3–4 in. long; flowers 1–3 in axils of small triangular puberulous deciduous bracts, pedicels ·25 in. long at first brown-puberulous with 2 subulate puberulous deciduous bracteoles ·15 in. long at base of calyx. *Buds* narrowly spindle-shaped slightly falcate puberulous. *Calyx* 1–1·25 in. long, soon glabrescent, mouth very oblique splitting to the base down the back the tip with 5 teeth of which 2 or casually 3 are narrowly subulate ·2 in. long much exceeding the others. *Corolla* bright-red 2–2·5 in. long, standard 1 in. wide, wings and free keel-petals subequal about ·5-·6 in. long. *Ovary* softly grey-puberulous 2 in. long, stalked. *Pod* 6–12 in. long on a stalk ·75–1 in. long, black glabrescent distinctly torulose 6–8-seeded, usually the lowest and 1–3 of the uppermost seeds abortive, valves ultimately irregularly shred, hardly distinctly dehiscent; seeds subreniform ·6 in. long ·4 in. wide testa warm-brown, hilum large oval dark-grey with pale margin. DC. Prodr. II, 412; Roxb. Flor. Ind. III, 249; Wall. Cat. 5963; W. & A. Prodr. 260; Wight, Ic. t. 58; Miq. Flor. Ind. Bat. I, 207; Bak. in Flor. Brit. Ind. II, 188. *E. spathacea* Wall. Cat. 5965, fide Baker. *E. Corallodendrum* Linn. Sp. Pl. 706, in part. *E. cuneata* Grah. in Wall. Cat. 5967, fide Baker.

Andamans; on all the coasts common, *Kurz! Prain!* Nicobars; common behind the sea beaches, *King's Collectors!* Perak; *Scortechini!* Malacca; fide Baker in *Flora of British India.* Distrib. Sea-shores of S.-E. Asia, from the Sunderbuns to the Malay Archipelago and Polynesia.

This, as a wild species, is purely littoral; where it occurs inland it has certainly been planted.

Mr. Baker refers here *E. cuneata* Grah. which the writer has not seen; also *E. spathacea* Wall. Cat. 5965. What Wallich's 5965 B. & C. (which were doubtfully identified with 5965 A) may have been, it is difficult to say; they were Himalayan plants and are not at Calcutta. But the Calcutta example of 5965 A is not named *E. spathacea* as in the Lith. Cat., but is named *E. stricta*; the specimen belongs moreover to *E. stricta* and not to *E. indica.*

Subgen. 2. Micropteryx Walp. *Calyx* campanulate, more or less distinctly 2-lipped, but not splitting down to the base. *Pod* turgid and seed-bearing throughout.

2. Erythrina ovalifolia Roxb. Hort. Beng. 53. A tree 30–40 feet high with spreading branches, bark grey, stem 1·5–2 feet diam., armed with thick-based dark-brown prickles. *Leaves* 8–12 in. long; petioles 4–5 in. long sparsely prickly, when young very sparingly puberulous, when full grown quite glabrous; leaflets 3 subcoriaceous deep green above glaucous beneath quite glabrous on both surfaces, terminal ovate or ovate-oblong 4–6 in. long 2·5–3·5 in. across, lateral pair similar but rather smaller, base rounded or wide-cuneate apex obtuse or subacute; petiolules ·25 in. long; stipels represented by ovate persistent glands ·1 in. in diam.; stipules membranous orbicular deciduous ·15 in. across. *Inflorescence* in lax 8–20-fld. racemes 3–6 in. long on stout spreading peduncles 5–8 in. long; flower 1–3 in axils of small broadly ovate deciduous puberulous bracts; pedicels puberulous ·3 in. long with similar but smaller bracteoles at base of calyx. *Buds* narrowly ovate, puberulous. *Calyx* ·5 in. long, ·6 in. wide deeply 2-lobed. *Corolla* 2 in. long dark velvety-brown with deep scarlet tinge, standard 1·5 in. wide emarginate, wings ·75 in., keel-petals coherent 1 in. long. *Ovary* softly grey-puberulous, stalked. *Pod* 6–8 in. long 6–8-seeded on a stalk ·5 in. long, pale-brown puberulous, valves more distinctly dehiscing by the sutures; seeds subreniform ·5 in. long, ·3 in. wide, testa brown, hilum large oval. Roxb. Flor. Ind. III, 254; Wall. Cat. 5961; Wight Ic. t. 247; Benth. Pl. Jungh. 237; Miq. Flor. Ind. Bat. I, 207; Bak. in Flor. Brit. Ind. II. 189. *E. holosericea* Kurz, Journ. As. Soc. Beng. XLII, pt. 2, 69 as to flowers. *Duchassaingia ovalifolia* Walp. in Linnæa XXIII, 742.

Perak; Kinta, *Kunstler* 7215! Malacca; *Maingay* 528! Distrib. S.-E. Asia, from Assam and Bengal to the Malay Archipelago and Polynesia.

Mr. Kurz's *Erythrina holosericea* (*Corallodendron holosericeum* O. Kuntze, Rev. Gen. Pl. I, 172) is a spurious species manufactured by combining in one diagnosis a description of the flowers of *E. ovalifolia* and of the leaves of *E. lithosperma*; the *mélange* had been sent to Herb. Calcutta by an officer of the Indian Forest Department under the idea that it came from one tree. The citation of this species by Kuntze (*loc. cit.*) while that author is taking the opportunity to (as the writer thinks) unnecessarily restore an obsolete generic name, might lead to the conclusion that Kuntze had made an effort to verify the validity of the Kurzian species, as to the existence of which Mr. Baker had already expressed a doubt (*Flora of British India* II, 190). It is obvious, however, that Kuntze has done nothing of the kind and it would seem from this citation that the object of much of the *bouleversement* effected by priority-hunting "botanists" is less the restoration of generic names that have been improperly suppressed than a search for opportunities of posing as the authorities for species of whose characters they are ignorant.

In the Herbarium of Mr. Curtis, of the Penang Forest Department, is a solitary

specimen of an *Erythrina* belonging to this section, collected in Langkawi. The flowers are precisely those of *E. suberosa*, a glabrous form of which is common in Burma and Tenasserim; it may, therefore, well belong to that species. But the solitary branchlet is densely prickly whereas it is a feature of both the tomentose Indian and the glabrous Indo-Chinese form of *E. suberosa* to have almost unarmed branchlets. As moreover, Mr. Curtis' specimen is without leaves, the writer cannot on its authority alone, formally include *E. suberosa* among the Malayan species.

Subgen. 3. Hypaphorus Hassk. *Calyx* campanulate more or less distinctly 2-lipped, but not splitting down to the base. *Pod* flat seedless and indehiscent below, 1–3-seeded towards upper half.

3. Erythrina lithosperma Miq. Flor. Ind. Bat. I, 209 not of Blume. A tree 40–60 feet high with spreading branches, bark white, stem 2 feet in diam., armed with strong prickles. *Leaves* 10–12 in. long; petioles 4–5 in. long with a few prickles or unarmed, when young brownish-grey puberulous soon glabrous; leaflets 3 membranous uniformly bright green densely brownish-grey puberulous when young soon quite glabrous, triangular-ovate cuspidate at apex, terminal wide-cuneate at base 4–6 in. long 3–4 across, lateral pair rounded at base rather smaller; petiolules ·3 in. long; stipels represented by oblong glands ·15 in. long ·1 in. across; stipules deciduous shortly ovate-acute flaccid densely puberulous. *Inflorescence* in short rather dense racemes 3–4 in. long on stout spreading woody peduncles 5–8 in. long, flowers 1–3 in axils of minute ovate-acute bracts; pedicels ·2 in. long puberulous, minutely bracteolate at base of calyx. *Buds* puberulous ovate. *Calyx* ·3 in. long, softly persistently puberulous, equally 2-lipped. *Corolla* 1·5 in. long, standard oblong obtuse, crimson or crimson with white stripes, wings and keel ·5 in. long subequal. *Ovary* compressed faintly puberulous. *Pod* glabrous pale-yellow, 4–8 in. long, 1·25 in. wide in the wing like compressed seedless indehiscent lower half to two-thirds, ·6 in wide in the upper 1–3 seeded dehiscent portion; seeds subreniform ·75 in. long ·4 in. wide, testa almost black, hilum small elliptic pale. Bak. in Flor. Brit. Ind. II, 190. *E. sumatrana* Miq. Flor. Ind. Bat. Suppl. 304; Kurz, As. Soc. Beng. XLII, 2, 70. *E. secundiflora* Hassk. Pl. Jav. Rar. 378; Benth. Pl. Jungh, 237 not of Brotero. *E. holosericea* Kurz, Journ. As. Soc. Beng. XLII, 2, 69 as to leaves.

Penang; *Wallich!* Perak; at Kinta, *Kunstler!* at Waterloo, *Curtis* 2982! *Scortechini* (a MSS. description only.) Singapore; *Hullett!* Distrib. Indo-China, from the Shan Plateau, to the Malay Archipelago.

Mr. Kurz, as Mr. Baker remarks, has pointed out that the present species is *Erythrina sumatrana* Miq.; authentic examples of *E. sumatrana* in Herb. Calcutta, show that this is the case. But the only difference between *E. sumatrana* Miq. and *E. lithosperma* Bl. (ex Miq. in Flor. Ind. Bat.),—to which Mr. Baker has referred the Indo-Chinese plant that agrees in every respect with the Sumatra and Perak one,—

is in the size of the pods; those of *E. sumatrana* are rather larger than those of *E. lithosperma*. Both species are retained in the *Index Kewensis* but the writer agrees with Mr. Baker in believing that they do not deserve to be treated even as separate varieties. Kurz further states that *E. lithosperma* Blume ex Miq. in Flor. Ind. Bat. is not the same as *E. lithosperma* Bl. Cat. Bogor., which, according to Kurz, was introduced to the Buitenzorg garden from Mauritius. Koorders and Valeton, in their valuable Java Herbarium, issue the common wild Java plant which only differs from *E. sumatrana* in having rather smaller pods, under the name *E. lithosperma*; they have however in every case named the plant *E. lithosperma* Miq. not *E. lithosperma* Bl. In their *Bijdragen* II, these authors explain that Blume's "*E. lithosperma*" is only *E. indica*; this being the case the name *E. lithosperma*, but on Miquel's authority, not as that of Blume, is still available for the present species. Here again Kuntze's pretentious *Revisio* fails to assist the serious student; Kuntze claims the authorship of both, as *Corallodendron lithospermum* and *C. sumatranum* respectively, thus clearly indicating that he has failed to make himself acquainted with the characters of either.

22. Spatholobus Hassk.

Woody climbers, with 3-foliolate stipellate leaves. *Flowers* small or middle-sized, in ample terminal panicles, extending into the axils of the upper leaves, the pedicels densely fascicled at the tumid nodes. *Calyx* campanulate; teeth lanceolate or oblong-deltoid, the upper two connate. *Corolla* distinctly exserted, its petals subequal, the keel obtuse, nearly straight. *Stamens* diadelphous; anthers uniform. *Ovary* sessile or stalked, 2-ovuled; style incurved, beardless, stigma capitate. *Pod* flat, winglike, indehiscent, seedless below; thick, 1-seeded, tardily dehiscent at tip. Species 10, the others Malayan and one Tropical African.

Leaflets not twice as long as broad, the terminal leaflets dissimilar, rhomboid; (leaflets large 3 in. across manifestly pubescent beneath, rachis prolonged beyond attachment of lateral leaflets; flowers blue or purple):—

Leaflets puberulous above, uniformly tomentose beneath; flowers ·25 in. long, distinctly pedicelled ... ... 1. *S. ferrugineus.*

Leaflets glabrous above, tomentose only on the nerves beneath; flowers ·15 in. long, very shortly pedicelled .. 2. *S. gyrocarpus.*

Leaflets at least twice as long as broad, all subsimilar lanceolate or oblanceolate to ovate:—

Leaf-rachis hardly prolonged beyond the insertion of lateral leaflets, leaflets large 3·5 in. across (sparsely pubescent on the nerves beneath) ... ... 3. *S. bracteolatus.*

Leaf-rachis distinctly prolonged beyond the insertion of lateral leaflets, leaflets medium or small not more than 2 in. across:—

Petiolules and leaflets beneath finely adpressed puberulous (stipels manifest flexuous):—

Petiolules twice as long as stipels, flowers pink, branches of panicle lax; leaflets elliptic-acuminate... 4. *S. acuminatus.*

Petiolules shorter than stipels, flowers white, branches of panicle strict, leaflets ovate-lanceolate acute 5. *S. dubius.*
Petiolules and leaflets beneath glabrous :—
Leaflets thickly coriaceous (oblong, stipels obscure rigid) flowers purple, calyx densely rusty-pubescent... 6. *S. crassifolius.*
Leaflets chartaceous, flowers white, calyx glabrescent or puberulous :—
Leaflets oblong, stipels obscure rigid, calyx glabrescent, branches of panicle strict ... ... 7. *S. Maingayi.*
Leaflets oblanceolate, stipels manifest flexuous, calyx finely puberulous, branches of panicle lax ... 8. *S. Ridleyi.*

1. SPATHOLOBUS FERRUGINEUS Benth. Pl. Jungh. 238. A robust woody climber 30–60 feet long with a stem 3-6 in. thick; branchlets densely rusty-tomentose, brown beneath the tomentum, cylindric. *Leaves* 9 in. long; leaflets 3, coriaceous dull green puberulous above, everywhere rusty-pubescent beneath, terminal ovate apex obtuse base rounded, 5–6 in. long 3 in. across, lateral obliquely elliptic 4·5–5·5 in. long as wide as terminal, lateral nerves 5–7 pairs ascending and midrib prominent beneath, cross-nerves and fine reticulate venation very distinct; petiole 3–4 in. long rusty-pubescent, petiolules ·25 in. also densely rusty; stipels subulate small; stipules broad-based triangular ·25 in. long, very densely rusty, deciduous. *Inflorescence* 8-10 in long, in lax axillary panicles with stout densely rusty-pubescent somewhat flattened peduncles, branches 4–6 in. long again paniculate the bracts at their bases triangular subpersistent; pedicels distinct ·2 in. long in fascicles of 2–5, bracteoles shorter than buds. *Calyx* densely rusty-pubescent ·2 in. long, teeth deltoid shorter than tube subequal except the rounded slightly emarginate upper. *Corolla* claret-coloured to dark-blue, ·25 in. long, standard oblong deeply notched. *Pod* 3–5 in. long, softly velvety, semi-transparent except at the seed-bearing tip, ·7 in wide below ·3 in. wide at seed-bearing apex. Miq. Flor. Ind. Bat. I, 204. *Drebbelia ferruginea* Zoll. in Nat. en Geneesk. Arch. III, 79.

PERAK; very common at low elevations, *Wray* 1941! 2008! 2381! 3258! *Scortechini* 213! 1466! *Kunstler* 3566! 6862! 7904! PENANG; Govt. Hill, *King! Abrams! Curtis!* MALACCA; *Maingay* 530! *Griffith! Derry* 1203! *Goodenough* 1437! SINGAPORE; *Hullett* 211! *Ridley* 3609! DISTRIB. Sumatra, Java, Borneo.

From Singapore comes also a form collected twice by Mr. Ridley (n. 5578! n. 6394!) with a close red-silky tomentum beneath. This bears to ordinary *S. ferrugineus* very much the relationship that *Butea sericophylla* Wall. bears to *S. Roxburghii* (*Butea parviflora*) and it has not therefore been here separated as a variety, though it is certainly a very distinct "form" of *S. ferrugineus*. While very near *S. gyrocarpus* this species is quite readily separable by its nearly always rather smaller leaves; its always different tomentum; its always larger flowers with much longer pedicels, and its differently shaped more persistent bracts. The fruits are however,

exceedingly similar; but this is true also of *S. acuminatus*, *S. riparius*, *S. squamiger* and *S. Listeri*, four species that have fruits hardly distinguishable from those of *S. gyrocarpus* and *S. ferrugineus*.

Judging from the field notes of Mr. Kunstler and from a manuscript description written by Father Scortechini, *S. ferrugineus*, though a large climber, rarely if ever attains the dimensions of *S. gyrocarpus*, the next species.

2. Spatholobus gyrocarpus Benth. Pl. Jungh. 238. A robust woody climber sometimes over 100–150 feet long with a stem 4–6 in. thick; branchlets closely shortly rusty-pubescent, black beneath the tomentum, slightly angular. *Leaves* 12 in. long; leaflets 3 subcoriaceous bright green and glabrous above rusty-pubescent on all veins and nerves beneath, terminal obovate-rhomboid apex rounded with a short point base cuneate, 5–6 in. long, 4·5–5 in. wide, lateral obliquely elliptic 5–6 in. long 3·5–4 in. wide base obliquely rounded apex as in terminal; lateral nerves 6–8 pairs ascending and midrib prominent beneath, cross-nerves and fine reticulate venation very distinct; petiole 4–6 in. rusty puberulous, petiolules ·3 in. also rusty; stipels subulate small; stipules broad-based ovate-lanceolate ·3 in. long very early deciduous. *Inflorescence* in lax axillary panicles sometimes 12 in. long with stout somewhat flattened rusty-puberulous peduncles, branches 6–8 in. long again paniculate, the bracts at their bases small lanceolate early deciduous; pedicels very short, bracteoles at base of calyx linear shorter than buds early deciduous. *Calyx* grey silky-pubescent ·1 in. long, teeth deltoid shorter than the tube subequal except the triangular slightly notched upper. *Corolla* deep-claret to dark-blue, ·15 in. long, standard wide-orbicular deeply notched. *Pod* 3–5 in. long 1 in. wide below, seed-bearing tip ·3 in. wide, softly velvety, semitransparent except at the seed-bearing apex. Bak. in Flor. Brit. Ind. II, 193; Miq. Flor. Ind. Bat. I, 204. *Butea gyrocarpa* Wall. Cat. 5442.

Perak; very common at low elevations, *Kunstler* 3181! 7770! 8182! 10390! 10458! Penang; *Wallich* 5442! *Stoliczka!* Distrib. Philippines.

This, though common, appears to be hardly so frequent as the last species which it much resembles, especially as regards pods. The tomentum of this species is however, less dense and less red than in *S. ferrugineus* and the flowers are about half the size. This has never been sent to Calcutta from Malacca though *S. ferrugineus* is very plentiful there.

3. Spatholobus bracteolatus Prain. A slender creeper 15–20 feet long with sparsely rusty-pubescent branches. *Leaves* 10–12 in. long; leaflets 3 ovate-acute or shortly acuminate, the tip slightly mucronate, subcoriaceous glossy bright green on both surfaces very sparsely beset with short rusty adpressed hairs, midrib beneath prominent more densely adpressed-pubescent, lateral nerves ascending 8–9 pairs promi-

nent, cross-nerves distinct, terminal and lateral subequal subsimilar- 8–9 in. long, 3·5 in. across; petiole 2–2·5 in. long densely adpressed rusty-pubescent, scarcely prolonged beyond attachment of lateral leaflets, petiolules ·3 in. long also densely rusty; stipels short subulate, stipules ·25 in. long, deciduous, membranous, densely rusty, lanceolate; leaves towards ends of branches sometimes 1-foliolate. *Inflorescence* in terminal and axillary panicles 1·5–2 ft. long, branches 3–4 in. long again paniculate, with smaller sometimes 1-foliolate leaves at their bases, or bractless; pedicels very short, bracteoles at base of calyx lanceolate ·2–·25 in. long, longer than buds, early deciduous. *Calyx* pale-brown pubescent, ·15 in. long, lower teeth sublinear central longer than lateral all shorter than calyx tube, upper lip triangular notched at apex. *Corolla* shortly exserted small, colour not noted, standard orbicular-oblong slightly retuse. *Pod* not seen.

Perak; in dense jungle on Gunong Batu Pateh, at 3000–4000 feet, *Kunstler* n. 8079!

This in externals more resembles *S. Roxburghii* than it does any other Malayan species, and may possibly be the plant from Penang, noted by Mr. Baker as having been confused by Dr. Wallich with *S. gyrocarpus* under *Cat.* n. 5442; at Calcutta, however, *all* the specimens of *Cat.* n. 5442 are genuine *S. gyrocarpus*. The present plant was not identified with any species at Kew and in any case it is certainly not a form of *S. Roxburghii;* it differs in having smaller flowers; narrower, relatively longer bracteoles, and much longer stipules—the latter in *S. Roxburghii* are triangular and though wider at the base are only ·15 in. long. The stipels on the other hand are small and obscure and the most striking difference between this plant and *S. Roxburghii*, or indeed between it and any other species of *Spatholobus* is that the rachis of the leaf is so shortly prolonged beyond the attachment of the lateral pair of leaflets that the leaf is at times subdigitately 3-foliolate.

4. Spatholobus acuminatus Benth. Pl. Jungh. 238. A robust climber with branches at first minutely downy soon glabrescent. *Leaves* 8–10 in. long; leaflets 3, all oblong-cuspidate rounded at the base, 4–6 in. long, 1·5–2 in. across, subcoriaceous, pale green on both surfaces glabrous above, under the lens very minutely and sparsely puberulous beneath, midrib prominent beneath very sparsely shortly puberulous, lateral nerves 8–10 pairs spreading very slender, fine reticulations distinct but not prominent; petiole 2–4 in. long glabrescent, petiolules ·2 in. adpressed puberulous; stipels short subulate, stipules ovate-lanceolate ·25 in. long ·15 in. wide, very early deciduous. *Inflorescence* in short axillary panicles 6–8 in. long, branches 1·5–2 in. long again paniculate; pedicels slender usually 2–3 together ·2 in. long. *Calyx* puberulous ·15 in. long, teeth oblong obtuse half as long as tube the upper slightly emarginate. *Corolla* ·4 in. long, bright red (*fide* Baker), standard orbicular emarginate. *Pod* 3–5 in. long, softly velvety, semi-transparent except at seed bearing tip, ·7 in. wide below ·3 in. wide at tip. Miq.

Flor. Ind. Bat. I, 204; Bak. in Flor. Brit. Ind. II, 194. *Sapindacea* Wall. Cat. 8082. *Butea acuminata* Wall. Cat. 5443.

PENANG; *Wallich* 8082! ANDAMANS; common, *King's Collectors!* DISTRIB. Martaban.

The solitary Malayan specimen at Calcutta that appears referable to this species is one issued by Dr. Wallich as *Sapindacea* sp. (*Cat.* n. 8082); this specimen is not dealt with in the *Flora of British India*. So far as it goes it agrees better with Dr. Wallich's Martaban specimens of *S. acuminatus* (*Cat.* n. 5443) than it does with any Malayan species of *Spatholobus*, to which genus it manifestly belongs; the specimen is, however, only in very young flower. No one has met with it in Penang since Dr. Wallich collected it.

Mr. Baker's description of *S. acuminatus* does not apply to Dr. Wallich's *Butea acuminata* in so far as the lengths of the panicles and of the pedicels are concerned. His description would apply to *Wall. Cat.* 5907 (Pongamia rosea *Grah.*) which Mr. Baker also includes here; *Pongamia rosea* certainly *is* a *Spatholobus* but is a species very distinct from *S. acuminatus*. There are not at Calcutta examples of *Wall. Cat.* 5908 or *Wall. Cat.* 9054; both are here excluded because Mr. Baker expresses a doubt regarding both. The first may indeed prove to be the same as *Spatholobus riparius* Prain; of the second nothing can be said because, in the *Flora of British India*, it is referred not only to *S. acuminatus*, but also to *Derris thyrsiflora*.

The Andamans specimens are absolutely identical with Wallich's original specimens (*Cat.* 5443) from Martaban.

5. SPATHOLOBUS DUBIUS Prain. A large climber 100–150 feet long, stem 6–8 in. diam. with round adpressed-puberulous branches. *Leaves* 6–8 in. long; leaflets 3 ovate-acuminate base rounded the tip slightly mucronate, coriaceous glossy bright green, glabrescent above adpressed-puberulous beneath, lateral nerves ascending 8–9 pairs prominent beneath, cross-nerves distinct; terminal 2–6 in. long 1·5–3 in. wide, lateral subsimilar rather smaller; petioles 1·5 in. long puberulous, petiolules ·15 in. pubescent; stipels subulate ·15–·2 in. long, stipules lanceolate ·2 in. deciduous; leaves towards ends of branches sometimes 1-foliolate. *Inflorescence* in terminal and axillary spreading panicles the former sometimes 8 in. the latter 4 in. long, sometimes 2–3 from same axil. *Bracts* lanceolate persistent adpressed-pubescent ·15 in. long equalling the pubescent solitary or fasciculate pedicels; bracteoles minute. *Calyx* adpressed-pubescent, ·12 in., campanulate, teeth short triangular except the 2-fid upper. *Corolla* ·25 in. long, pure white, standard orbicular retuse. *Pod* not seen.

PERAK; Gunong Bubu, 800–1200 feet, *Kunstler* 7585! PENANG; Govt. Hill, *Curtis* 2970!

A very distinct species apparently nearest to *S. littoralis* Hassk. from which it differs in having the lower lip of calyx toothed and the leaves uniformly puberulous beneath. The shortness of its petiolules, which are equalled and often exceeded in length by the subulate stipels, renders the species easily distinguishable.

6. SPATHOLOBUS CRASSIFOLIUS Benth. Pl. Jungh. 238. Apparently

a strong climber, branches at first rusty-pubescent at length glabrescent. *Leaves* 8–10 in. long, all oblong-cuspidate, cuneate at the base, 4–6 in. long 1·5–2 in. wide, thickly rigidly coriaceous, dark green and quite glabrous on both surfaces midrib prominent beneath glabrous, lateral nerves 6–7 pairs and secondary nervation very slightly raised; petiole 2–4 in. long glabrous, petiolules ·2 in. glabrescent; stipels short subulate often obscure, stipules lanceolate ·2 in. long very early deciduous. *Inflorescence* of short axillary panicles 8–9 in. long, branches about 2 in. long, again paniculate, peduncles rusty-pubescent with a few ovate-acute deciduous leaf-scales at their base; pedicels very short, rusty-pubescent. *Calyx* densely rusty-velvety, ·1 in. long, teeth all deltoid shorter than the tube. *Corolla* ·2 in. long, dark-purple, limb of standard much broader than deep, deeply emarginate at apex subcordate at junction with claw. *Pod* not seen; when immature with a stalk (*fide* Baker.) Bak. in Flor. Brit. Ind. II, 194. *Pongamia ? crassifolia* Grah. in Wall. Cat. 5913.

Penang; *Wallich !* Distrib. Silhet.

This is very distinct by reason of its leaves and (from Mr. Baker's description) on account of its stipitate pod. Dr. Wallich's original specimens from Silhet and Penang seem undoubtedly examples of one species; strangely, it has not been sent again to Calcutta from either locality.

7. Spatholobus Maingayi Prain. A large climber with glabrous branches. *Leaves* 4–5 in. long; leaflets 3 ovate-acute base rounded tip slightly mucronulate, thickly coriaceous glabrous on both surfaces, lateral nerves ascending 5–6 pairs slightly prominent beneath cross-nervation distinct but not prominent; terminal 3 in. long 1·75 in. wide; lateral rather smaller; petiole 2 in. glabrous, petiolules ·25 in. quite glabrous; stipels subulate ·1 in. long, stipules ovate ·1 in. long, deciduous. *Inflorescence* in terminal and axillary panicles 6–8 in. long. *Bracts* minute subulate persistent puberulous, as are the rachis and pedicels shorter than calyx; bracteoles very minute. *Calyx* adpressed-puberulous ·12 in. long, campanulate, teeth all short rounded. *Corolla* white ·25 in. long, the standard orbicular deeply emarginate. *Ovary* hirsute 2-ovuled.

Malacca; *Maingay* 611! Perak; *Kunstler* 3535! 4652! 6906! 10428! *Scortechini* 206! 1537! Singapore; *Ridley !*

This evidently quite common species has never yet been reported in fruit. It appears from a note in Herb. Calcutta that Mr. Kurz had supposed it might be the same as *S. macropterus* Miq.; the flowers, however, differ slightly and, in their venation, the leaves of the two species differ markedly. Father Scortechini on the other hand thought when he collected it that this might be *Derris* (*Aganope*) *macrophylla*, a reasonable supposition in the absence of fruit since the flowers of *Spatholobus* are very like the flowers of *Aganope* and since the obscureness, and indeed at times apparently total absence, of stipels from the leaves of this species leads to their being

easily overlooked. There are, however, very few specimens without stipels on *some* of their leaves and the writer has therefore followed Mr. Kurz in referring the plant to *Spatholobus*. The matter cannot, however, be conclusively settled till pods are obtained and examined. The only other species with equally obscure stipels is *S. crassifolius*, of which, however, Mr. Baker has seen immature fruit.

8. Spatholobus Ridleyi Prain. A climber with glabrous slightly-angled branches. *Leaves* 6 in. long; leaflets 3 subequal oblanceolate apex acuminate tip mucronulate base cuneate, papery quite glabrous on both surfaces, 3–3·5 in. long 1–1·25 in. wide; petiole glabrous 1·5 in. long, petiolules glabrous ·2 in. long; stipels small rigid subulate, often very obscure; stipules lanceolate ·25 in. long subrigid parallel-veined. *Inflorescence* in axillary racemes 3 in. long 1 in. wide, bracts and bracteoles minute deciduous. *Calyx* ·12 in. campanulate adpressed-pubescent, upper tooth truncate the others rounded half as long as tube, pedicels ·2 in. long, adpressed-puberulous. *Corolla* ·25 in., white, standard orbicular, limb slightly auriculate, apex retuse. *Pod* 4 in. long, 1 in. wide below, seed-bearing tip ·4 in. across; sparsely puberulous, reticulate-veined, semitransparent except at apex.

Singapore; *Ridley* 6401!

A very distinct species though nearest to *S. macropterus* Miq.

23. Indigofera Linn.

Herbs or shrubs more or less densely clothed with adpressed hairs, with (in Malayan species) compound odd-pinnate leaves. *Flowers* small in copious axillary racemes. *Calyx* minute campanulate; teeth 5, subequal or the lower longest. *Corolla* caducous, standard obovate; keel straight, not beaked, laterally spurred near base. *Stamens* diadelphous, anthers uniform apiculate. *Ovary* sessile many-ovuled; style short incurved, stigma capitate penicillate. *Pod* linear-cylindric several-seeded. Species about 250; in all tropical regions and in temperate South Africa.

The genus is hardly a Malayan one; the above definition applies, as to foliage, only to the species that occur in the Malay Peninsula.

Herbaceous; stems densely pubescent; pod short straight pubescent ... ... 1. *I. hirsuta.*

Shrubby; stems faintly hoary; pod glabrous:—

Calyx deeply cleft, about half as long as corolla; pods reflexed:—

Leaflets ovate-acute; racemes dense, pods short much recurved ... ... 2. *I. Anil.*

Leaflets obovate-obtuse; racemes lax, pods longer straight or only slightly recurved at the tip ... ... 3. *I. tinctoria.*

Calyx shortly toothed, hardly ⅓ as long as corolla; pods ascending ... ... 4. *I. galegioides.*

1. INDIGOFERA HIRSUTA Linn. Sp. Pl. 751. An annual or biennial suberect herb 1–3 or 4 feet high; stem densely covered with soft short spreading grey or brown pubescence. *Leaves* 2–5 in. long, short-petioled; leaflets terminal and in 2–5 opposite pairs, obovate 1–2 in. long, membranous greyish-green above, glaucous beneath, densely coated with adpressed hairs; stipules setaceous, plumose. *Racemes* 2–6 in. long, short-peduncled, very dense-fld. *Calyx* densely pubescent, ·15 in. long; teeth setaceous plumose; tube very short. *Corolla* ·2 in. long, little exserted, purple or red. *Pod* ·5–·7 in long, straight, densely covered with spreading grey pubescence, 6–8 seeded. DC. Prodr. II. 228; Roxb. Flor. Ind. III, 376; Jacq. Ic. I, 569; Wall. Cat. 5450; Hook. Comp. Bot. Mag. t. 24; W. & A. Prodr. I, 204; Miq. Flor. Ind. Bat. I. 304; Bak. in Flor. Brit. Ind. II, 98. *I. ferruginea* Schum. & Thonn. Pl. Guin. 370.

PAHANG; *Ridley!* PENANG; *Curtis!* MALACCA; *Ridley!* SINGAPORE; *Hullett!* DISTRIB. Tropics generally.

2. INDIGOFERA ANIL Linn. Mantiss. 272. A shrub 4–6 feet high with twiggy woody thinly silvery branches. *Leaves* 2–3 in. long, petioles ·5–1 in.; leaflets terminal and in 5–8 opposite pairs, ovate-acute ·5–1 in. long, membranous, green; stipules subulate. *Racemes* 1–2 in. long, dense-fld., nearly sessile. *Calyx* ·04 in. silvery, teeth acute as long as tube. *Corolla* purple ·15–·2 in., distinctly exserted. *Pods* ·4–·6 in. long ·1 in. thick glabrescent retro-falcate 4–6-seeded. Miq. Flor. Ind. Bat. I, 307. Bak. in Flor. Brit. Ind. II, 99. *I. tinctoria* VAR. *Anil* Kurz Journ. As. Soc. XLV, pt. 2, 269 excl. all syn.

ANDAMANS; Port Blair, not uncommon. A native of America but not uncommon in cultivation and as an introduced escape or weed in the Old World. This is apparently much commoner in Indo-China than it is in India; it is frequently mistaken for *Indigofera coerulea* Roxb. which however appears to be exclusively an Indian plant.

3. INDIGOFERA TINCTORIA Linn. Sp. Pl. 751. A shrub 4–6 feet high with twiggy woody thinly silvery branches. *Leaves* 1–2 in. long, petioles ·5–1 in.; leaflets terminal and in 4–6 opposite pairs, obovate-oblong, ·5–1 in. long membranous, green; stipules subulate. *Racemes* 2–4 in. long, lax-fld. nearly sessile. *Calyx* ·04 in., silvery, teeth acute as long as tube. *Corolla* reddish-yellow ·15–·2 in., distinctly exserted. *Pods* ·7–1 in. long ·1 in thick, glabrescent straight, or slightly recurved towards tip, 8–12-seeded. DC. Prodr. II, 224 (*var. a.* only); Roxb. Flor. Ind. III, 379; Wall. Cat. 5474; W. & A. Prodr. I, 202; Wight, Icon. t. 365; Miq. Flor. Ind. Bat. I, 306; Bak. in Flor. Brit. Ind. II, 99. *I. indica* Lamk, Encyc. Meth. III, 245. *I. sumatrana* Gærtn. Fruct. II, 317, t. 148.

PENANG; cultivated, *Curtis!* MALACCA; *Griffith!* PANGKORE; *Scortechini!* PAHANG; "growing near Sultan's tomb," *Ridley!* SINGAPORE;

Ridley! A native apparently of the Old World; often cultivated and occasionally occuring as an escape.

4. Indigofera galegioides DC. Prodr. II, 225. A tall shrub, reaching 8 feet high, with twiggy woody branches at first adpressed-pubescent at length glabrescent. *Leaves* distinctly petioled, 8–12 in. long; petioles ·5–2 in.; leaflets terminal and in 6–12 lateral pairs, oblong obtuse, of varying size generally ·5 in. long by ·3 in. across but sometimes 1–2 in. long, membranous, green above glaucescent beneath very obscurely adpressed hirsute; stipules distinct, stipels minute. *Racemes* 2–3 in. long, short-peduncled, very dense-fld. *Calyx* ·04 in. long, hoary, teeth very short, deltoid. *Corolla* pale-red ·4–·5 in., finely canescent externally. *Pods* glabrous 2·5–3 in. long, cylindric, straight, beaked, 15–18-seeded. Miq. Flor. Ind. Bat. I, 310; Bak. in Flor. Brit. Ind. II, 100. *I. uncinata* Roxb. Fl. Ind. III, 382; Wall. Cat. 5472. *I. Finlaysoniana* Wall. Cat. 5488.

Malay Peninsula; Perak; *Kunstler*, 316! Malacca, *Griffith!* Langkawi, *Curtis*, 2865! Distrib. Ceylon; Indo-China; S. China; Philippines; Malay Archipelago.

Very easily distinguished from other species by the fact that its pods instead of spreading or being reflexed, are fastigiately grouped with their apices pointing in the direction of the apex of the peduncle. It is often planted for ornament and is perhaps not really native in Malaya.

24. Sesbania Pers.

Soft-wooded shrubs or trees with long, very narrow abruptly * pinnate leaves with very numerous deciduous linear-oblong obtuse mucronate leaflets. *Flowers* in axillary racemes. *Calyx* campanulate shallowly 2-lobed or 5-toothed. *Corolla* much exserted; petals all with long claws; standard broad keel straight and obtuse or subrostrate and recurved. *Stamens* 2-adelphous; anthers uniform. *Ovary* stipitate, linear, many-ovuled; style filiform, incurved glabrous; stigma capitate. *Pod* very long and narrow, dehiscent; septate between the very many seeds. Species about 40, cosmopolitan in the tropics.

Flowers small, bud straight (§ *Eusesbania*); annual shrubs:—	
Pod twisted pendulous; stems thick pith-like; flowers ·75 in. long	1. *S. paludosa.*
Pod not twisted usually ascending; stems woody very slender; flowers ·4 in. long	2. *S. cannabina.*
Flowers large, bud falcately recurved (§ *Agati*); a tree ...	3. *S. grandiflora.*

1. Sesbania paludosa Roxb. Hort. Beng. 56 (*sub* Aeschynomene). A large tree-like herb with annual stems reaching 12 feet in height,

* By an unfortunate oversight this character is not made prominent in the Keys to the tribes and genera, p. 22 and p. 33.

2 in. in diam. full of white soft pith, quite unarmed as are the leaf rachises. *Leaves* 4–12 in. long, sessile, leaflets 10–30 pairs dark-green sparingly hirsute above. *Racemes* drooping 8–12-fld., 4–5 in. long equalling or slightly exceeding the leaves in whose axils they arise. *Flowers* yellow the standard externally dotted with small purple spots ·75 in. long. *Pods* 10–12 in. long flexible with strong not indented sutures always pendulous and always twisted. *S. grandiflora* Miq. Flor. Ind. Bat. I, 288, not of Pers. *S. cochinchinensis* Kurz Journ. As. Soc. Beng. XLV, 2, 271, not of DC. *S. punctata* Benth. MSS. in Herb. Kew, not of DC. *S. aculeata* VAR. *paludosa* Bak. in Flor. Brit. Ind. II, 115 (in part only and excluding the syn. *Aeschynomene uliginosa*). *Aeschynomene paludosa* Roxb. Hort. Beng. 56; Flor. Ind. III, 333, not *S. paludosa* Jacq.

KEDAH; open marshy ground near rice-fields, *Kunstler* 1712! DISTRIB. Bengal; Burma; China; Java.

Roxburgh, who knew the Bengal *Sesbanias* well, has left of most of them, under the name of *Aeschynomene*, unmistakeable descriptions and figures which subsequent Indian botanists have for some reason treated with little consideration. A careful examination of living plants shows, however, that Roxburgh's treatment of the forms is probably accurate, and his views of the limitation of the species are certainly preferable to any that have since been proposed.

The present species is the familiar *Kathsola* (as opposed to the true *Sola* which is *Aeschynomene aspera*), so common in marshes throughout the Gangetic Delta.

Though recognised as distinct by Prof. Miquel, that author unfortunately has used a specific name that is pre-occupied in the genus. Mr. Kurz thought it might be *Coronilla cochinchinensis* Lour. but that species has erect torulose pods and the identification is therefore impossible. Mr. Bentham has suggested its being *Sesbania punctata* but the pods and the stem structure forbid this identification also. As *Sesbania paludosa* Jacq. is not this species but is Roxburgh's *Aeschynomene uliginosa* it seems best to conserve Roxburgh's specific epithet *paludosa* for the very distinct plant to which he originally applied it.

Dr. Kuntze (*Rev. Gen. Plant.* I, 181) would reduce this to *Sesbania ægyptiaca*! an excellent instance of the unscientific use of the imagination.

2. SESBANIA CANNABINA Pers. Synops. II, 316. A tall and slender unarmed woody herb, stems reaching 20 feet in height without exceeding ·5 in. in diam. at base. *Leaves* 2–3 in. long, sessile; leaflets 8–20 pairs, glabrous, very dark green. *Racemes* short (under 1 in.) but distinctly peduncled, 2–4-fld.; flowers yellow, the standard externally closely purple-streaked, ·4 in. long. *Pods* very often solitary rarely more than 2, spreading or pendulous rarely erect, 4–8 in. long; sutures stout straight, valves not depressed between the seeds. DC. Prodr. II, 265; Miq. Flor. Ind. Bat. II, 286, excluding syn. *S. cannabina* W. & A. *S. affinis* Schrad. in DC. Prodr. II, 265. *S. polyphylla* Miq. Flor. Ind. Bat. II, 288. *S. aculeata* VAR. *cannabina* Bak. in Flor. Brit. Ind. II, 115. *Aeschynomene cannabina* Retz. Obs. V, 26; Roxb. Flor. Ind. III, 335.

Tongkah ; *Curtis' Collector* 2861 ! Distrib. Lower Bengal, commonly cultivated ; Lower Burma ; Java.

This species has, like the last, been much misunderstood. It is the familiar *Dunchi* plant of Bengal, where it is widely cultivated ; to a slight extent on account of its fibre which, being more resistent to water than other kinds is employed in making fishing nets and lines ; to a greater extent for its long lithe stems that are used as the wattles of which are constructed the walls of the houses in which *Piper Betle* is grown in Bengal. Probably this is an introduced plant in Malay countries.

3. Sesbania grandiflora Pers. Synops. II, 316. A soft-wooded tree 20–30 feet high and 8–10 in. in diam. at base, with virgate terete branches. *Leaves* 6–12 in. long, leaflets 16–30 pairs, linear-oblong glabrous, pale-green. *Racemes* short (1 in. long), 2–4-fld., but distinctly peduncled ; flowers white or pink. *Calyx* ·8 in. deep, glabrous, shallowly 2–lobed. *Corolla* 3–3·5 in. long. *Pods* up to 20 in. long, falcate or straight, firm, sutures thick straight, valves slightly depressed between the seeds. Bak. in Flor. Brit. Ind. II, 115. *Agati grandiflora* Desv. Journ. Bot. I, 120, t. 4 ; Miq. Flor. Ind. Bat. I, 289.

Perak ; Thaipeng, *Scortechini* 525 ! Singapore ; *Kunstler* 1147 ! *Hullett* 819 ! Distrib. Mascarene Islands to N. Australia, usually planted.

The *Agati* tree, which is very doubtfully native either in India or Malaya, is often grown as a support for Pepper-vines in Southern India. In Northern India it is chiefly planted for the sake of its showy flowers.

25. Tephrosia Pers.

Herbs or undershrubs with compound odd-pinnate or, rarely, simple leaves ; the leaflets opposite, subcoriaceous. *Flowers* in terminal and leaf-opposed racemes. *Calyx* campanulate with distinct subequal teeth. *Corolla* much exserted, petals clawed, standard suborbicular ; keel incurved, not beaked. *Stamens* diadelphous, anthers uniform, obtuse. *Ovary* sessile, linear, many-ovuled ; style much incurved, flattened or filiform, silky or glabrous ; stigma capitate often penicillate. *Pod* linear flattened, many-seeded, 2-valved, continuous or obscurely septate between the seeds. Species about 100, in all tropical regions.

The above definition applies only to the species of the Malay Peninsula.

An undershrub ; calyx-teeth short, deltoid	1.	*T. candida.*
Herbs ; calyx-teeth narrow cuspidate as long as the tube :—		
Pods glabrescent	2.	*T. purpurea.*
Pods clothed with persistent brownish silky hairs ...	3.	*T. Hookeriana.*

1. Tephrosia candida DC. Prodr. II, 249. A low shrub, 4–6 feet high, with slender woody grooved branches clothed with brown or grey

persistent velvety pubescence. *Leaves* short-petioled 6–9 in. long; leaflets terminal and in 9–12 opposite pairs, ligulate, acute, 1·5–2 in. long, green and glabrous above, grey and thinly silky beneath; stipules setaceous, ascending. *Racemes* copious, terminal and lateral, 6–9 in. long, lower flowers fasciculate; pedicels ·25–·4 in., silky. *Calyx* densely silky, ·2–·25 in. long, teeth much shorter than tube. *Corolla* ·75–1 in., rose or white, standard densely silky. *Pods* 3–4 in. long, 10–15-seeded, slightly recurved, clothed with adpressed brown silky hairs; style silky, flattened. Wall. Cat. 5627; W. & A. Prodr. 210; Bak. in Flor. Brit. Ind, II. 111. *Robinia candida* Roxb. Flor. Ind. III, 327. *Kiesera sericea* Reinw. in Miq. Flor. Ind. Bat. I, 291. *Xiphocarpus candidus* Hassk. Pl. Rar. Jav. 336.

Singapore; *Anderson!* *Hullett!* Distrib. Himalayas, Western Indo-China, Malay Archipelago.

2. Tephrosia purpurea Pers. Synops. 329. A copiously branched suberect herbaceous perennial with slender firm terete glabrescent stems. *Leaves* short-petioled 3–6 in. long; leaflets terminal and in 6–10 opposite pairs, narrowly oblanceolate obtuse, ·5 in. long, green and glabrescent above, glaucous and obscurely silky beneath; stipules subreflexed. *Racemes* copious all lateral, 3–6 in. long, lax-fld.; lowers flowers fasciculate; pedicles ·1–·2 in., bracteoles minute. *Calyx* densely silky ·1–·15 in. long; teeth linear as long as tube. *Corolla* ·25–·3 in. long, red, standard thinly silky. *Pods* 1·5–2 in. long, 6–8-seeded, slightly recurved, glabrescent; style glabrescent; stigma penicillate. DC. Prodr. II, 251; Wall. Cat. 5638; W. & A. Prodr. 213; Miq. Flor. Ind. Bat I, 296; Bak. in Flor. Brit. Ind, II, 112. *Galega purpurea* Linn. Sp. Pl. ed. II, 1063; Roxb. Flor. Ind. III, 386.

Malacca; *Griffith!* Penang; *Curtis!* Pahang; *Ridley!* Selangor; roadsides, *Ridley* 7291! Distrib. S.-E. Asia.

The form found in the Malay Peninsula is the typical plant described by Linnaeus and by Roxburgh as *Galega purpurea*. Mr. Ridley has noted on his Selangor specimens:— "*Indigofera*, introduced by Tamils, now established."

3. Tephrosia Hookeriana W. & A. Prodr. 212; var. *amoena* Prain. A slightly-branched erect herbaceous perennial with firm terete finely downy branches. *Leaves* short-petioled 4–8 in. long; leaflets terminal and in 6–9 opposite pairs narrowly oblanceolate, truncate, 1 in. long, green and glabrous above, grey and thinly silky beneath; stipules linear erect. *Racemes* copious all lateral, 6–9 in. long, lax-fld.; pedicels ·1 in. long: bracteoles minute. *Calyx* densely silky ·15–·2 in. long: teeth setaceous rather longer than tube. *Corolla* ·35–·5 in. long, red, standard thinly silky. *Pods* 2–2·5 in. long, 8–10-seeded, slightly recurved, densely clothed with persistent brownish silky hairs; style flattened

glabrescent; stigma penicillate. *Tephrosia amœna* Wall. in Hort. Calcutt. not of Eckl.

Penang; *Curtis!* Malacca; *Maingay! Derry!* Distrib. N. India.

This differs from Wight and Arnott's *T. Hookeriana* (*T. colutea* Wight in Wall. Cat. 5647 not of Pers.) in having leaflets almost twice as long and glabrous above; in true *T. Hookeriana* the leaflets are pubescent above as well as beneath. As Hamilton in *Trans. Linn. Soc.* XIII, 546 gives the alternative name *Tephrosia hirta* to the *Galega hirta* cited under this species by Mr. Baker, it must follow, if Mr. Baker's identification be correct, that the name *T. hirta* Ham. should be cited for the species. Dr. Hamilton's diagnosis, however, is of a plant with "falcate" pods in "dense" racemes, two characters which exclude *T. hirta* from this species and which point to its being a form of *T. villosa*.

There is little doubt that in a critical review of the genus the Malayan and North Indian plant should be looked on as specifically distinct from the true *T. Hookeriana* of Southern India; but as an African *T. amœna* Eckl. has already been published, Dr. Wallich's MSS. name is not available. The species might, however, be known as *Tephrosia subamœna*. The *Tephrosia amœna* "Pers." cited by Mr. Baker does not exist.

26. Millettia W. & A.

Trees, shrubs or large woody climbers with odd-pinnate, rarely-1-foliolate leaves; the leaflets opposite and usually large, generally stipellate. *Flowers* large and showy in axillary solitary or fascicled racemes and in terminal panicles, the florets single or in fascicles along the rachis. *Calyx* cup-shaped lobed or slightly toothed; teeth 5 or the 2 upper connate or absent. *Corolla* much exserted, petals long-clawed; standard broad spreading or reflexed, auricled or not at the base; wings free or only cohering at the tip, oblong sickle-shaped; keel incurved obtuse. *Stamens* monadelphous or diadelphous, the vexillary filament being united at the base or as far as the middle with the others, or being quite free; anthers uniform, filaments filiform. *Ovary* linear sessile or shortly stalked surrounded at base by an annular disc-like sheath; ovules rather numerous; style filiform incurved glabrous, stigma capitate. *Pod* linear, lanceolate or oblong, usually compressed and flat, occasionally turgid; thickly coriaceous or woody; late or hardly dehiscent. Species about 60; especially prevalent in Indo-China and Malaya.

The genus *Millettia* is retained here because its species are familiar to residents in the east under this name. But, as Baron von Mueller has shown, there is no room for a genus *Millettia* apart from *Wistaria*. The name *Wistaria* unfortunately, though it has come into common use among horticulturists, is not the one that was originally given to the genus. The oldest name, as pointed out by Dr O. Kuntze, is *Phaseoloides* and this, in a modified form, that author proposes to employ. Adjectives are not, however, advisable as generic names and the name *Kraunhia* which, as Sir Joseph Hooker and Mr. Jackson point out, is the earliest unobjectionable name, appears to be that which, when the two genera are united, must be employed for their species.

Inflorescences in axillary or terminal racemes or panicles; leaves scattered along the branches :—

Standard not auricled at the base of the lamina (§ *Eumillettia*), or auricles only represented by callosities :—

Leaves *lustrous beneath with thin lepidote silky pubescence;* (pods turgid silky; leaves exstipellate) ... 1. *M. sericea.*

Leaves opaque beneath, glabrous when mature, or silky only on the nerves beneath (*M. Hemsleyana*); (pods woody) :—

Pods turgid rugose; leaves rigidly coriaceous; racemes densely thyrsoid; flowers dark-red or purple : (leaves without stipels) :—

Bracts large suborbicular, *young racemes strobilate;* standard silky externally; pods pubescent ... 2. *M. eriantha.*

Bracts small ovate early deciduous; standard glabrous externally; pods glabrous ... ... 3. *M. atropurpurea.*

Pods flat smooth (lenticelled in *M. glaucescens*); leaves membranous (subcoriaceous in *M. cærulea*); racemes lax; flowers white, pink or blue :—

Leaflets without stipels, membranous; racemes distinctly peduncled; pods glabrous *(standard 2-callose)* :—

Standard glabrous externally :—

Pods lenticelled, the sutures slightly winged; leaflets subglaucous quite glabrous beneath ... 4. *M. glaucescens.*

Pods not lenticelled the sutures thickened but not winged; leaflets pubescent on midrib and nerves beneath ... ... 5. *M. Hemsleyana.*

Standard silky externally; (pods not lenticelled, sutures not winged; leaflets glabrous beneath) 6. *M. decipiens.*

Leaflets stipellate, subcoriaceous; racemes very close and short peduncled; pods pubescent externally; (leaves glabrous beneath; flowers blue) ... 7. *M. cærulea.*

Standard auricled at base of lamina (§ *Otosema*); (leaves subcoriaceous opaque beneath, pods pubescent) :—

Pods very wide turgid; leaflets small many obtuse; flowers pink, or white with pink tinge; panicles wide short :—

Leaflets densely velvety beneath; pod obpyriform, longitudinally channelled, pubescence short, pale-purple brown ... ... 8. *M. Maingayi.*

Leaflets glabrescent beneath; pod oval, not chanelled, pubescence long, dark-brown ... ... 9. *M. oocarpa.*

Pods flat; leaflets large few caudate-acuminate; flowers pure white :—

Leaflets 5–7, rarely 3; pods soft brown-velvety ... 10. *M. albiflora.*

Leaflets *solitary;* pods pale yellowish-velvety ... 11. *M. unifoliata.*

Flowers *solitary along leafless stem* on conical processes in axils of leaf-scars; leaves *tufted at top of slender stems* ... 12. *M. cauliflora.*

1. Millettia sericea W. & A. Prodr. 263. A large woody climber 80–100 feet long, in dense forest; in the open a low spreading shrub 8–25 feet high; stems 3–6 in. diam.; branches striate shortly finely pubescent. *Leaves* 8–12 in. long, leaflets terminal and in 3–4 opposite petiolulate pairs, without stipels; obovate to elliptic-oblong, entire, apex bluntly cuspidate, base rounded or cuneate, 3–5 in. long 1·5–3 in. wide; coriaceous, deep-green and glabrous above glossy and silvery-grey or light-brown from a minute scale-like pubescence beneath; petiolules ·2 in. long. *Racemes* axillary nearly as long as the leaves, slightly pubescent, the nodes not produced, each with the scars of 7–8 flowers. *Flowers* on pedicels ·15 in. long bracteolate under the calyx. *Calyx* wide-tubular, limb truncate ·15 in. deep, dark-brown silky externally. *Corolla* ·5 in. diam., standard orbicular long-clawed, whitish pink or blue internally, brown-silky externally, wings clawed, purple or pink with white stripes. *Vexillary filament* hardly cohering at base with the remaining stamens. *Ovary* pubescent, style glabrous. *Pod* 3–7 in. long 1 in. across, densely brown-tomentose with a rusty shining velvety tomentum, turgid when ripe. *Seeds* 1–3, rarely 4, testa dark-brown smooth; 1 in. long, ·75 in. diam. Miq. Flor. Ind. Bat. I, 153; Bak. in Flor. Brit. Ind. II, 104. *Pongamia sericea* Vent. Hort. Malmais. sub. t. 28; DC. Prodr. II, 416. *Phaseolodes sericeum* Kuntze Rev. I, 201.

Var. *typica;* leaflets silvery beneath; sutures of young pods distinctly thickened; seeds 1–2, rarely 3.

Perak; common; *Scortechini! Kunstler! Wray!* Distrib. Sumatra (*Teysmann! Forbes* 3103A!); Java (*Kurz!*)

A small-leaved form of *M. sericea* is reported from Penang (*Curtis n.* 844!); Lobb *n.* 310 in Herb. Kew, not seen by the writer, is noted by Mr. Hemsley as identical with it; and the same plant is also at Kew from Singapore, as it is at Calcutta from Perak (*Kunstler n.* 401! *Wray n.* 2364!). But the Perak specimens have in some cases leaflets of the ordinary size on the same twig with the small leaflets; the flowers of this form are exactly like those of *M. sericea* and the Penang plant is therefore not even separable as a variety.

Var. *malaccensis;* leaflets brownish underneath; sutures of young pods hardly thickened; pods longer seeds 3–4.

Malacca; *Griffith* 1764! *Maingay* 518! *Goodenough* 1706!

A distinct local form but perhaps hardly a good variety.

2. Millettia eriantha Benth. Pl. Jungh. 250. A rather slender woody climber 50–80 feet long with only the youngest twigs silky. *Leaves* 8–11 in. long, rachis glabrous, leaflets terminal and in 2, rarely 3, opposite pairs, petiolulate without stipels; obovate-oblong or elliptic shortly cuspidate 2–4 in. long, 1·25–2·5 in across, rigidly coriaceous pale green and glabrous on both surfaces; petiolules ·25 in. *Racemes* copious, at first short dense 1–1·5 in. long and strobilate with large

suborbicular cuspidate densely silky bracts, ultimately thyrsoid 6 in. long; the bracts deciduous ·3 in. in diam.; pedicels ·15 in. long. *Calyx* wide-campanulate ·4 in. long, externally uniformly pubescent with brownish silky hairs; the teeth triangular two-thirds as long as tube. *Corolla* dark-red within, the standard externally densely glossy-brown silky nearly 1 in. long. *Pod* turgid, 3 in. long 1·75 in. across, 1-seeded; woody, rugose, clothed with pale brown hairs; slightly beaked. Miq. Flor. Ind. Bat. I, 155; Bak. in Flor. Brit. Ind. II, 108.

Perak; common, *Wray!* *Scortechini!* *Kunstler!* Malacca; very common, *Griffith!* *Maingay!* *Derry!* *Goodenough!* Singapore; *Ridley* 6396! 6663! Pahang; *Ridley* 2644!

3. Millettia atropurpurea Benth. Pl. Jungh. 249. An erect tree 30–80 feet high 3–4 feet in girth; branches and thick branchlets grey but glabrous. *Leaves* 15–18 in. long, leaflets terminal and in 3–4 opposite pairs petiolulate without stipels; narrow-oblong, base rounded or rarely cuneate apex obtuse or shortly cuspidate, 4–6 in. long 1·5–2 in. across, rigidly coriaceous green and glabrous on both surfaces, upper surface shining; petiolules ·25 in. *Racemes* copious in a dense terminal thyrsoid hoary-tomentose panicle 6–8 in. across; bracts small ovate deciduous, ·1 in. in diam.; pedicels ·2 in. long, rusty-pubescent thickening in fruit. *Calyx* ·25 in., campanulate, teeth small the two upper truncate the others acute, thinly silky externally. *Corolla* dark-purple, standard 1 in. long ovate-obtuse, glabrous externally. *Vexillary stamen* free; ovary pubescent. *Pod* turgid, 3 in. long 2 in. across, 1–2 seeded; woody subrugose quite glabrous; slightly beaked. Miq. Flor. Ind. Bat. I, 157; Bak. in Flor. Brit. Ind. II, 108. *Pongamia atropurpurea* Wall. Cat. 5910; Pl. As. Rar. I, t. 78.

Perak; *Scortechini* 193! 273! *Kunstler* 8012! Penang; *Wallich* 5910! Malacca; common. Singapore; *Hullett* 60! Distrib. Tenasserim; Sumatra.

4. Millettia glaucescens Kurz in Journ. As. Soc. Beng. XLII, 2. 67. A large tree with glabrous branches the smaller ones slightly angled. *Leaves* 8–9 in. long; rachis glabrous; leaflets terminal and in 4–5 opposite petiolulate pairs; lowest pair broadly ovate the rest obovate-oblong all acuminate, 3·5–5 in. long 1·25–1·75 wide; membranous, bright green above glaucescent beneath, glabrous from an early stage on both surfaces; petiolules ·2 in. *Racemes* axillary slender 6 in. long, at first puberulous as are the capillary solitary, paired, or fascicled pedicels, ·2 in. long. *Calyx* wide shallow-tubular, slightly pubescent, obscurely toothed, ·15 in. deep. *Corolla* ·4 in. long, standard orbicular glabrous externally, 2-callose at base, steel-blue (*fide* Kurz); wings clawed. *Vexillary filament* cohering half way up staminal

sheath. *Ovary* pubescent style glabrous. *Pod* 5–6 in. long, 1 in. wide, thickish, woody, usually tubercled rarely reticulated on the faces, quite glabrous; both sutures thickened and expanded into narrow wings. Bak. in Flor. Brit. Ind. II, 107.

Perak; Kapayong Kurta, *Wray* 168! *Scortechini* (specimens with reticulated but not tubercled pods)!

By its pods this species is most nearly allied to *M. tetraptera* Kurz, but it has very different leaves which resemble those of *M. pubinervis* and *M. Hemsleyana* except in being glabrous. It agrees with these two species also as regards structure of flowers though not as regards pods. As regards leaves it likewise much resembles *M. decipiens* and *M. dehiscens;* in these species, however, not only are the pods without wings along the thickened sutures but the standard is silky externally.

5. Millettia Hemsleyana Prain. An erect bushy tree 20–40 ft. high, stem 10–15 in. in diam.; branches puberulous when young. *Leaves* 6–8 in. long, rachis pubescent, leaflets terminal and in 3–4 opposite petiolulate pairs, without stipels; lowest pair broadly ovate the rest elliptic-obovate all obtusely acuminate, 2–3·5 in. long, 1·25–1·5 in. wide; membranous bright green glabrous from an early stage above subglaucous and pubescent beneath with scattered flexuous spreading hairs which quickly disappear except from the midrib and main lateral nerves; petiolules ·2 in., stipules large, ·25 in., deciduous. *Racemes* axillary, slender simple, 2·5–4 in. long, at first puberulous as are the capillary, solitary or fascicled pedicels, ·25 in. long, subtended by lanceolate deciduous bracts ·2 in. long. *Calyx* wide shallow-tubular, slightly pubescent, obscurely toothed, ·15 in deep, red, or green with a reddish tinge. *Corolla* ·4 in. long, standard orbicular 2-callose at base glabrous externally, white or faintly tinged with pink, wings clawed. *Vexillary filament* cohering nearly half way up staminal sheath. *Ovary* pubescent, style glabrous. *Pod* 3·5-4 in. long ·5 in. wide, thin, quite glabrous, sutures slightly thickened not winged. *Kraunhia Hemsleyana* Prain MSS.

Perak; *Wray* 3310! 3608!

Millettia Hemsleyana is very closely related to *M. pubinervis* Kurz, a Tenasserim species; it has however rather narrower leaflets and differs especially in having large stipules and bracts. To *M. glaucescens* it is also closely related, but it differs in having pods that are neither winged along the sutures nor lenticelled along the valves. Both in pods and in foliage it likewise closely resembles *M. decipiens* but that species differs in having a pubescent standard.

6. Millettia decipiens Prain. An erect wide-spreading tree 40–60 feet high, stems 2–3 feet in diam.; branches all glabrous the smaller slightly angled. *Leaves* 8–9 in. long; rachis glabrous; leaflets terminal and in 4–5 opposite petiolulate pairs; lowest pair broadly ovate the rest elliptic-obovate all acuminate 2–3·5 in. long 1·25–1·5 in. wide;

membranous rather dark green on both surfaces glabrous from an early stage on both surfaces except for occasionally a few scattered hairs on the midrib beneath; petiolules ·2 in. *Racemes* axillary slender simple 6–8 in. long, at first puberulous as are the capillary solitary or fascicled pedicels. ·2 in long. *Calyx* wide shallow-tubular, slightly pubescent, obscurely toothed, ·15 in. deep. *Corolla* ·4 in. long, standard orbicular, densely silky externally, 2-callose at base, pink, or white with a pink tinge, wings clawed. *Vexillary filament* cohering half way up staminal sheath. *Ovary* pubescent, style glabrous; ovules 4. *Pod* 4–5 in. long, nearly 1 in. across, glabrous, sutures not thickened. *Kraunhia decipiens* Prain MSS.

Perak; Ulu Slim, 400 feet, *Kunstler* 10718! Kwala Dipong, *Scortechini* 1749! Pluss river, *Wray* 548! Pahang; Kwala Tahan, *Ridley* 2591!

The flowers of this species so much resemble those of *Pongamia glabra* that, with flowering examples, only careful dissection to ascertain the number of ovules satisfactorily distinguishes the two. Another species extremely nearly related to this is *Millettia dehiscens (Pongamia dehiscens* Koord. & Val. *Bijdr.* II. 96) a Java tree with the same silky standard, but with the ovary 5- or more-ovuled; its leaves are like those of *M. glaucescens*, its pods like those of *M. ovalifolia*.

7. Millettia coerulea Bak. in Flor. Brit. Ind. II, 107. A woody climber with glabrous branches. *Leaflets* terminal and in 3 petiolulate pairs, stipellate; obovate-oblong cuspidate 4–6 in. long; subcoriaceous, glabrous on both sides from an early stage; petiolules ·15 in. long. *Racemes* short-peduncled, close, axillary. *Flowers* short-pedicelled, densely fascicled. *Calyx* campanulate ·1 in., faintly silky, nearly truncate. *Corolla* three times the calyx, the standard densely white-canescent on the back. *Stamens* monadelphous. *Pod* large flat rather woody, linear-oblong 7–8 in. long, 1·5–1·75 in. wide, recurved, late in dehiscing, clothed with dense short persistent brown-velvety pubescence. *Pongamia coerulea* Grah. in Wall. Cat. 5894.

Malacca; *Griffith*. Distrib. Burma.

The above description is taken from the *Flora of British India*, there being no specimen at Calcutta either of the Burmese or of the Malacca types of Mr. Baker's species. The specimens here that accord best with the description are some from Penang (*Curtis* n. 2459); they are in fruit only and may prove to belong to *M. coerulea*. The plant is noted, however, as a "tree;" the specimens have 5-foliolate leaves and the leaflets resemble those of *M. albiflora*, of which it may equally well be a variety.

8. Millettia Maingayi Bak. in Flor. Brit. Ind. II, 110. A creeper over 100 feet long; young branches pale brown-pubescent. *Leaves* 8–10 in. long, leaflets terminal and in 5–8 opposite pairs, shortly petioluled stipellate; oblong, base rounded, apex rounded or subacute, 1·5–2 in. long 1 in. across, coriaceous, light green and glabrous above, velvety

underneath as is the leaf-rachis; petiolules ·2 in., stipels setaceous, persistent. *Racemes* in small axillary panicles one-third as long as leaves, 2·5 in. long, 1·5 in. across; rachis and pedicels rusty-pubescent, as are the linear deciduous bracts ·1 in. long; pedicels ·1 in. *Calyx* ·2 in. campanulate, externally rusty-pubescent, teeth wide-triangular half as long as tube. *Corolla* white tinged with pink, ·5 in. long, standard orbicular, auriculate at base of lamina, slightly emarginate and slightly puberulous externally. *Pod* oblong or obpyriform, woody indehiscent (*fide* Baker), rounded at both ends, 6 in. long 3·5 in. wide, turgid, shortly pale rusty-brown velvety, the surface traversed by deep longitudinal grooves.

Singapore; cultivated, *Maingay*; *Ridley!* Selangore; in dense jungle at 800–1200 feet elev., *Kunstler* 8759!

A remarkable species, originally described by Mr. Baker from a fruiting specimen. To the kindness of Mr. Ridley, the Calcutta Herbarium owes the possession of excellent flowering and fruiting examples of the plant; from these the above description has been drawn up. Mr. Kunstler's plant from Selangore is unfortunately only in flower; it agrees however in every detail with the flowering specimens sent from the Singapore garden by Mr. Ridley.

The only near ally of *M. Maingayi* is the next species from which it differs in having larger pods that, according to Mr. Baker, do not dehisce and in having leaflets densely tomentose beneath.

9. Millettia oocarpa Prain. A large creeper, young branches glabrous. *Leaves* 6–8 in. long, leaflets terminal and in 4–6 opposite pairs, shortly petiolulate stipellate; oblong, rounded at both ends, 2–3 in. long, 1–1·5 in. across, the terminal considerably exceeding the others, subcoriaceous light green and glabrous above, whitish and very sparsely adpressed-puberulous, finely reticulately veined beneath; leaf-rachis puberulous as are the petiolules ·2 in. long; stipels setaceous persistent. *Racemes* in small axillary panicles one-half as long as leaves, 2·5 in. long, 1·5 in. across; rachis and pedicels slightly puberulous as are the linear deciduous bracts ·1 in. long; pedicels ·1 in. *Calyx* ·2 in. long, campanulate, externally grey-puberulous, teeth short obscure. *Corolla* white tinged with pink, ·5 in. long, standard orbicular, auriculate at base of lamina, entire, uniformly sparsely puberulous externally. *Stamens* diadelphous, vexillary filament free. *Ovary* 2-ovuled, pubescent. *Pod* oval, woody, dehiscent, rounded at both ends, 3·5 in. long, 1·75 in. in diam., turgid, densely dark brown-velvety, the surface smooth. *Kraunhia oocarpa* Prain MSS.

Perak; Batu Togoh, 250 feet, *Wray* 2141! *Scortechini* 429!

Very nearly related to *Millettia Maingayi* of which it has exactly the flowers. Its pods however are smaller, densely covered with darker and much longer hairs, and are distinctly dehiscent. In shape and size they resemble the egg of a domestic fowl. The leaflets too differ in not being velvety beneath, and the leaves are shorter.

10. Millettia albiflora Prain. A handsome spreading tree some-

times 80–100 feet high (*Kunstler*), usually 30–50 feet, trunk 2–3 feet in diam., branches glabrous. *Leaves* a foot long, leaflets terminal and in 2–3 more rarely 1, opposite pairs, shortly petiolulate without stipels, elliptic-lanceolate entire apex caudate base cuneate, 5–10 in. long, 1·5–2·5 in. across, lowest pair rather smaller, thickly membranous shining above dull beneath, with 6–9 pairs of ascending rather prominent lateral nerves and a very prominent midrib, quite glabrous on both surfaces, petiolules ·2 in. long. *Racemes* in very long narrow axillary panicles towards ends of branches, 1–1·5 feet long, 2·5 in. across; individual racemes subfastigiate 4–6 in. long with 10–12 solitary short-pedicelled flowers; pedicels ·15 in. long, rusty-puberulous as are the peduncles and main-rachis. *Calyx* ·25 in. long, rusty-puberulous, tube campanulate rather longer than the triangular teeth, the two upper teeth connate emarginate. *Corolla* pure white ·75 in. long, standard orbicular 2-auriculate at base of lamina, externally glabrous. *Vexillary filament* extending half way up the sheath or at length free on one side only, or on both. *Ovary* puberulous. *Pod* linear 7–13 in. long, 1·5–2 in. wide, straight flat rather woody, uniformly soft brown-velvety. *Kraunhia albiflora* Prain MSS.

Perak: Goping, *Scortechini* 1948! Ulu Salama, *Kunstler* 729! 1288! 4467! 5833! 5993! 6077! Larut, *Kunstler* 5357! 6709! 6842! Thaipeng, *Wray* 1864! Kota, *Wray* 1943! *Ridley* 7981! 8004! Pahang; Tahan, *Ridley* 2641!

A very fine species apparently extremely common in Perak. Mr. Kunstler notes that it is usually found near river-courses or in wet low ground.

11. Millettia unifoliata Prain. A handsome spreading tree 30–40 feet high, trunk 1 foot in diam., branches glabrous. *Leaves* consisting of a solitary terminal leaflet, petiolulate without stipels, obovate-oblong or lanceolate entire, apex acute rarely caudate, base cuneate, thickly membranous shining above dull beneath, with a prominent midrib and 6–9 pairs of ascending lateral nerves not much more prominent than the distinct secondary reticulations; glabrous on both surfaces; petiolule ·25 in. long directly articulate with branch. *Racemes* in very slender axillary panicles shorter than the leaflets, 3–4 in. long ·25–·35 in. across; individual racemes short 3–5-fld. separated from each other by intervals 1 in. long; peduncles and pedicles glabrous. *Calyx* ·2 in. long, externally glabrous, campanulate 2-bracteolate at base, bracteoles ovate-lanceolate minute, teeth shorter than tube hirsute within. *Corolla* pure white ·75 in. long, standard orbicular 2-auriculate at base of lamina, externally glabrous. *Stamens* monadelphous in a sheath split along the vexillary side. *Ovary* puberulous. *Pod* linear 6 in. long 1 in. across, flat, rather woody, tapering to both ends, finely pale yellowish-velvety externally. *Kraunhia unifoliata* Prain MSS.

Perak; Pangkore Island, *Curtis* 1615! *Scortechini* 1023! Tupia, *Wray* 2836! Blanja, *Scortechini* 124! 1711! Larut, *Kunstler* 4251! Goping, *Kunstler* 4492! 8210!

Very closely related to *Millettia albiflora* of which it has much the flowers and also much the fruits. It differs however from all other hitherto known *Millettias* in having 1-foliolate leaves. The pods are never so large as in *M. albiflora* and the inflorescence is very different in appearance owing to its being smaller and more slender.

12. Millettia cauliflora Prain. A small slender unbranched gregarious shrub 6–8 feet high, stems hardly ·5 in. in diam., with black lenticelled bark, bearing a terminal tuft of leaves and having small nodular flower-bearing projections in the axils of leaf-scars along the stem. *Leaves* 1–1·5 feet long, stipules subulate, ·3 in. long, caducous; rachis tawny-pubescent as are the petiolules and the setaceous persistent stipels; leaflets thinly membranous glabrous on both surfaces, lateral nerves in 5–7 ascending pairs impressed above very prominent like the midrib beneath; lowest pair 2 in. long 1·25 in. across, terminal and upper pairs 6 in. long 2 in. wide. *Calyx* ·2 in., glabrescent. *Corolla* (only withered specimens seen) apparently pink, standard apparently auricled. *Pod* solitary, at intervals along the stem, 3–3·5 in. long, ·6 in. wide, narrowed towards base, slightly recurved, rigidly coriaceous early dehiscent, externally grey silky-tomentose; seeds 2. *Kraunhia cauliflora* Prain MSS.

Perak; Larut, *Kunstler* 2555!

A very distinct species with leaves much like those of the African *Millettia macrophylla* Hook. f., but with fewer lateral nerves. It differs from all other known species in having solitary fruits (and apparently solitary flowers) in the axils of old leaf-scars along the stem. The standard seems to be auricled, but whether the stamens are monadelphous or diadelphous cannot yet be said.

27. Pongamia Vent.

A tree. *Leaves* odd-pinnate, leaflets opposite, ex-stipellate. *Flowers* racemed. *Calyx* campanulate, nearly truncate. *Corolla* much exserted; standard broad, silky; keel obtuse the petals cohering at their tip. *Stamens* monadelphous, the upper filament free low down; anthers oblong, versatile. *Ovary* subsessile, 2-ovuled; style incurved, glabrous, stigma capitate. *Pod* woody, somewhat turgid, oblong, indehiscent, not winged nor thickened at the sutures. A single species, on all coasts from the Mascarene Islands to Malaya, North Australia, and Western Polynesia.

Pongamia glabra Vent. Jard. Malm. t. 28. A fairly-large tree 40–60 feet high, with spreading glabrous branches; bark greyish-green soft, wood pale-yellow when cut, darkening on exposure; stem reaching 2–3

feet in. diam. *Leaves* 8–10 in. long, pale-green, leaflets usually 5–7, more rarely 7–9, oblong or ovate, rarely ovate-lanceolate, acute, base cuneate or deltoid; subequal, 3–7 in. long, 1–3·5 in. wide, subcoriaceous, glabrous on both surfaces or, rarely, slightly puberulous on the nerves beneath, lateral nerves about 8 pairs rather prominent beneath as is the midrib, rachis about 5 in. long glabrous as are the petiolules ·25 in. long. *Flowers* in rather short axillary racemes 4–6 in. long with peduncles 1–1·5 in. long, usually simple; nodes tumid bearing 2–4 subequal filiform pedicels, rachis and pedicels sparsely puberulous, pedicels ·25–·35 in. long, bracteolate at base and 2-bracteolate towards apex. *Calyx* wide-campanulate ·12 in. deep, ·15 in. wide, mouth truncated. *Corolla* ·35–·5 in. long, white with violet or pinkish flush, standard orbicular, silky on the back, subcordate and 2-auriculate at the base. *Stamens* monadelphous. *Ovary* finely pubescent, ovules 2, rarely 1. *Pod* turgid woody glabrous, 1·5–2 in. long, ·8–1·25 in. wide, ·25 in. thick, brownish-green with a short decurved point; seeds 1, very rarely 2, testa white, marbled with slightly raised brownish lines radiating irregularly from the hilum, ·7 in. long, ·5 in. wide.

Var. *typica;* leaflets usually 5, occasionally 7, oblong or ovate 2·5–3·5 in. wide, quite glabrous beneath; racemes always solitary simple, pedicels ·35 in. long, their bracteoles only sub-opposed and situated slightly above the middle. *Pongamia glabra* Vent.: DC. Prodr. II, 416; Wall. Cat. 5878; W. & A. Prodr. 262; Wight, Ic. t. 59; Bedd. Flor. Sylvat. t. 177; Miq. Flor. Ind. Bat. I, 147; Bak. in Flor. Brit. Ind. II, 240. *Pongamia grandifolia* Zoll. & Mor. Syst. Verzeichn. 3; Miq. Flor. Ind. Bat. I, 147. *Pongamia mitis* Kurz, Journ. As. Soc. Beng. XLV, 2. 128. *Robinia mitis* Linn. Sp. Pl. ed. II, 1044. *Galedupa indica* Lamk Encyc. Meth. II, 594 (excl. syn. *Caju galedupa* Rumph.); Roxb. Flor. Ind. III, 289. *Dalbergia arborea* Willd. Sp. Pl. III, 901. *Galedupa arborea* Roxb. Hort. Beng. 53.—Rheede Hort. Malab. VI, t. 3; Rumph. Herb. Amb. III, t. 117; Lamk Ill. t. 603.

In all the provinces, very abundant on the banks of every tidal river and along the margins of all Mangrove-swamps.—Distrib.; of the genus; often planted in inland districts.

Var. *xerocarpa;* leaflets 7–9, very rarely 5, lanceolate 1–1·35 in. wide, usually sparsely puberulous on the midrib and main veins beneath, racemes occasionally 2–3 in same axil and sometimes sparingly branched, the pedicels ·25 in. long with the bracteoles opposed and situated close under the calyx; ovules sometimes solitary. *Pongamia xerocarpa* Hassk. Retz. ed. nov. 208. *Malaparius flavus* Miq. Flor. Ind. Bat. I, 1082 in addend., hardly *Malaparius* Rumphius.

Pahang; *Ridley* 1362! Kedah; *Kunstler* 1740! Perak; Trang,

Kunstler 1420! 5625! MALACCA; *Derry* 939! DISTRIB. Ceylon (Thwaites C. P. 1489); Java; Sumatra.

Pongamia glabra is the well-known littoral species known in Southern India generally as *Pangam*, in Northern India as *Karanj*, in Burma as *Thin-win* and in Malaya as *Malapari*. Throughout India it is very generally planted, both as a timber tree, and for the sake of the oil obtained from its seeds; it does not seem to be planted in the Malayan provinces.

The typical variety appears in two somewhat distinct forms that pass, however, into each other by all kinds of intermediates. These are:—

(*α*) a form with medium-sized leaflets and flowers (the original *P. glabra*) which is spread throughout the area occupied by the species; also

(*β*) a form with decidedly larger leaflets and flowers (the form named *P. grandifolia* Zoll. & Mor.) which extends from north to south along the coasts of Chittagong, Arracan, the Andamans, Nicobars, Sumatra and Java, apparently without extending westward to the Sundribuns and India or eastward to Tenasserim and the Malay Peninsula.

VAR. *xerocarpa*, though only separable by characters that individually are trivial, nevertheless looks remarkably different from the type; it resembles far more the two species known as *Millettia decipiens*, and *Milletia dehiscens*. Indeed, with flowers alone, only a careful examination of the ovary, 4- or more-ovuled in the *Millettias*, 1- or 2-ovuled in the *Pongamia*, ensures accurate determination. The fruits of the *Millettias* are, however, dehiscent and therefore unlike those of *Pongamia*.

Roxburgh used for this genus Lamarck's name *Galedupa*, first applied in 1786. Lamarck's use of the name depended on his belief that *Caju galedupa* Rumphius (*Herb. Amboin.* II, t. 13) was this tree. As figured, however, *Caju galedupa* has equally-pinnate leaves, dehiscent pods and arillate seeds; *Pongamia glabra* has unequally-pinnate leaves, indehiscent pods, no arillus and a very small hilum. Moreover Rumphius describes and figures *Pongamia glabra* (*Herb. Amboin.* III, 117) under its Malay name *Malapari*. That Lamarck had detected his mistake is clear from his having abandoned the name *Galedupa* in 1797 (*Illustr.* t 603) in favour of *Pungamia* — taken from Adanson's name *Pongam* of 1768. This last Ventenat amended to *Pongamia* in 1803, and in that form has become familiar a name which, even were *Galedupa* accurately applicable, is much anterior to *Galedupa*. The point would not indeed call for discussion but for the fact that quite recently Taubert in the authoritative *Natürlichen Pflanzenfamilien* has re-adopted Roxburgh's usage. Kuntze, not satisfied even with this amount of change, desires to use the word *Caju(m)*; that is, he desires to use precisely the synonym which cannot be applied to the plant described by Lamarck, as the name of the plant to which Lamarck's definition belongs.

Loureiro, overlooking both Rumphius' description of the pods and his figure showing its leaflets as opposite, referred *Malaparius* to *Pterocarpus*; he has been followed in this by most subsequent botanists except Miquel, who, having seen specimens of *Malapari* collected in Sumatra by Teysmann, removed the plant from *Pterocarpus* and established it as a genus. Bentham (*Gen. Plant.* I, 465) expresses a doubt as to Teysmann's *Malapari* being conspecific with Rumphius' one. Everything, however, is in favour of the belief (unfortunately the Sumatra plant is unrepresented in Herb. Calcutta) that Teysmann's '*Malapari*' is *Pongamia glabra*, just as Rumphius' '*Malapari*' and the '*Malapari*' recently collected by Derry in Malacca, are *Pongamia glabra*. But it must be noted that while Rumphius' '*Malapari*' appears

to be typical *Pongmia glabra*, Derry's '*Malapari*' is VAR. *xerocarpa*, and so apparently, judging by Miquel's description, is Teysmann's.

28. DERRIS Lour.

Climbers, rarely erect trees. *Leaves* odd-pinnate, with usually exstipellate leaflets. *Flowers* copious, usually fascicled, showy, in axillary or terminal racemes or panicles. *Calyx* campanulate, nearly truncate. *Corolla* much exserted, standard broad; keel obtuse, the petals cohering slightly. *Stamens* usually monadelphous, the upper one free in § *Aganope;* anthers versatile. *Ovary* sessile, few-ovuled; style incurved, filiform, stigma capitate. *Pod* rigid, thin, flat, indehiscent, oblong if one-seeded, strap-shaped if few-seeded, with a distinct wing down the upper or both sutures. DISTRIB. Species about 40, belting the world in the tropics.

Standard not callose at the base :—
- Vexillary stamen free throughout; flowers single in ample thyrsoid panicles with nodes neither tumid nor produced into stalks (§ *Aganope*) :—
  - Pod winged only along the upper suture, and sinuate between the seeds; corolla over ½ in. long .. ... 1. *D. sinuata.*
  - Pod winged down both sutures, not sinuate between the seeds; corolla under ⅓ in. long :—
    - Buds and flowers distinctly pedicelled, bracteoles shorter than buds ... ... 2. *D. Wallichii.*
    - Buds and flowers subsessile, bracteoles exceeding the buds ... ... 3. *D. thyrsiflora.*
- Vexillary stamen united with the others at least in the centre of tube; flowers fascicled on tumid nodes that are sometimes produced into stalks :—
  - Pods winged only along upper suture :—
    - Pod narrow, pointed at both ends, several-seeded (§ *Brachypterum*):—
      - Climbers, leaflets 9–19 medium, acute; flowers in long lax panicles exceeding the leaves ... ... 4. *D. scandens.*
      - Trees, leaflets 25–39 small, rounded; flowers in dense panicles shorter than the leaves ... ... 5. *D. dalbergioides.*
    - Pod suborbicular or shortly broadly-oblong, obtuse, few-seeded (§ *Euderris*) :—
      - Leaflets glabrous, not exceeding 5 in. long, exstipellate; pods glabrous ... ... 6. *D. uliginosa.*
      - Leaflets pubescent beneath, often 6–8 in. long, stipellate; pods pubescent ... ... 7. *D. elegans.*
  - Pod winged along both sutures [unknown in *D. affinis* and *D. floribunda*] (§ *Dipteroderris*) :—
    - Rachis and branches of panicle densely silky; pod silky; (leaves faintly-veined) ... ... 8. *D. andamanica.*

Rachis and branches of panicle glabrous or sparsely puberulous; pod (where known) glabrous:—
Flowers white in laxly-branching panicles:—
Leaves with 10 pairs of prominent spreading secondary nerves; ovules 4 ... ... 9. *D. affinis.*
Leaves with 4–5 pairs of ascending faint secondary nerves; ovules 2–3 ... ... 10. *D. floribunda.*
Flowers pink in fastigiately-branching panicles (leaves with numerous spreading but not prominent secondary nerves; ovules 2; pod glabrous) ... ... 11. *D. amœna.*
Standard 2-callose at base (§ *Paraderris*):—
Leave and petals pubescent ... ... 12. *D. elliptica.*
Leaves and petals glabrous ... ... 13. *D. malaccensis.*

§ 1. Aganope. Robust climbers with large leaflets; flowers usually rather small in ample thyrsoid panicles, the nodes not produced into stalks; upper stamen quite free from the others down to the base; base of vexillum without callosities; pod winged down one or both sutures.

1. Derris sinuata Thwaites Enum. Pl. Zeylan. 93. A strong climber with dark-brown glabrous branches. *Leaves* 10–16 in. long; leaflets dark-green 5–7, coriaceous ovate- to ovate-oblong or elliptic, shortly cuspidate or subobtuse base rounded or widely deltoid, 4–5 in. long, 2–3 in. wide, glabrous on both surfaces, lateral nerves 5–7 pairs spreading hardly visible, rachis 6–12 in. long glabrous as are the petiolules ·25 in. long. *Flowers* in ample thyrsoid terminal, or terminal and axillary panicles 8–16 in. long, branches 1·5–3 in. long at intervals of ·5–1 in. their nodes not tumid nor produced into stalks, pedicels ·1 in. long (in fruit lengthening to ·25–·3 in.), stout, arranged usually in subopposite pairs ·2–·25 in. apart, occasionally all scattered, rachis and its branches glabrescent, pedicels adpressed rusty-puberulous, with small decidous bract at base and 2 very minute triangular deciduous bracteoles close to calyx. *Calyx* wide-campanulate thinly silky ·2 in. long, with ripe fruit ·25 in. in diam. circumscissile at base. *Corolla* ·6 in., standard erect orbicular ·5 in. wide, with ecallose cordate base. *Stamens* 2-adelphous, the vexillary filament free from the rest to the base. *Ovary* pubescent, ovules 5–7. *Pod* strap-shaped, coriaceous, distinctly reticulated, 2·5–8 in. long, 1·5 in. wide, upper suture narrowly winged, wing never exceeding ·1 in. in breadth, usually much less and sometimes barely perceptible, always more or less sinuate between the 1–5 seeds. Benth. Journ. Linn. Soc. IV, Suppl. 113; Bak. in Flor. Brit. Ind. II, 246. *Pongamia sinuata* Wall. Cat. 5911. *Pongamia grandifolia* Grah. in Wall. Cat. 5882, not of Zoll. & Mor.

Perak; on banks of tidal rivers, *Kunstler* 179! *Scortechini!* Malacca; river banks, *Griffith* 1773! *Maingay* 551! Distrib. Ceylon; Sundribuns: Coasts of Indo-China and the Malay Archipelago.

2. Derris Wallichii Prain. A strong climber with glabrous brownish lenticular branches. *Leaves* 8–12 in. long, leaflets pale-green, 5–9, subcoriaceous oblong-lanceolate acute, base rounded, 4–5 in. long 1·5–2 in. wide, glabrous on both surfaces, lateral nerves ascending 8-9 pairs prominent beneath, rachis 4–8 in. long glabrous as are the petiolules ·25 in. long. *Flowers* in ample thyrsoid terminal and axillary panicles 8–16 in. long, their branches ·5–1·5 in. long at intervals of ·25–·5 in., their nodes not tumid nor produced into stalks, pedicels ·2–·25 in. long arranged in subopposite pairs at intervals of ·2–·3 in., rachis and its branches thinly-silky as are the pedicels and calyx, bracts at base of pedicels ovate, much shorter than buds, lateral pair of bracteoles at their apices very minute. *Calyx* tubular at length campanulate, mouth truncate, ·12 in. long, ·15 in. wide. *Corolla* ·3 in. long, standard erect orbicular with cordate ecallose base. *Stamens* 2-adelphous, the vexillary filament quite free. *Ovary* pubescent, ovules 4. *Pod* broadly strap-shaped, thin, flat, glabrous, finely veined, 1·5–4·5 in. long, 1·5 in. wide 1–2-seeded, not sinuate between the seeds; distinctly winged down both margins. *Pterocarpus floribundus* Wall. Cat. 5846. *Derris thyrsiflora* Prain MSS. in Herb. Calcutta (as to Andamans specimens) hardly of Bentham.

Andamans; *King's Collectors!* Distrib. Silhet, Cachar and Khasia.

The Andaman specimens here described have leaves very like those of *D. thyrsiflora* but they have rather more nerves and are not quite so thick. The long pedicels, however, make it very easy to distinguish the two, while the fruits of *D. Wallichii* are broader than those of *D. thyrsiflora*. In distributing specimens from the Calcutta Herbarium those from the Andamans were unfortunately issued under the name *D. thyrsiflora*.

3. Derris thyrsiflora Benth. in Journ. Linn. Soc. IV, Suppl. 114. A large rambling bush or small tree with spreading branches, 15 to 20 feet high, or a robust climber reaching 60–80 feet in length, in either case with a stem 6–8 in. in diam. with glabrous lenticelled branches. *Leaves* 8–15 in. long, leaflets dark-green, 5–9, coriaceous oblong to oblong-lanceolate usually acute sometimes rounded at apex, base rounded or cuneate, 4–6 in. long, 1·5–2·5 in. wide, glabrous on both surfaces, lateral nerves ascending 5–7 pairs rather prominent beneath, rachis 4–10 in. long, glabrous as are the petiolules ·25 in. long. *Flowers* in ample thyrsoid terminal and axillary panicles 8–24 in. long, their branches ·5–2 in. long at intervals of ·25–·5 in., their nodes not tumid nor produced into stalks, pedicels in fruit under ·1 in. in flower hardly perceptible, arranged usually in close-set subopposite pairs, rachis and its branches thinly silky as is the subsessile calyx with linear deciduous basal bracteole as long as bud and with two very minute lateral bracteoles. *Calyx* tubular, at length campanulate, mouth truncate, ·12 in. long, ·15 in. wide, green-

ish white. *Corolla* white, ·3 in. long, standard erect orbicular ·35 in. wide, with ecallose cordate base. *Stamens* 2-adelphous, the vexillary filament free from the rest to the base, the free portion of all the filaments slightly puberulous. *Ovary* pubescent; ovules 4. *Pod* strap-shaped, thin, flat, glabrous finely-veined, 1·5–3·5 in. long, 1–1·25 in. wide, distinctly winged along both sutures, wings subequal ·2–·25 in. wide, not sinuate between the 1–3 (very rarely 4) seeds. Bak. in Flor. Brit. Ind. II, 246 (excl. syn. *Amerimnum obovatum* and *Pongamia* Wall. Cat. 9054). *Derris pyrrothyrsa* Miq. Flor. Ind. Bat. Suppl. 297. *Aganope floribunda* Miq. Flor. Ind. Bat. I, 151. *Millettia thyrsiflora* Benth. Pl. Jungh. 249.

Nicobars; Kamorta, *Kurz!* Kedah; Yau, *Ridley* 5224! Penang; *Curtis* 248! Malacca; *Griffith* 1776! *Maingay* 552! *Derry* 94! 1030! Perak; *Scortechini*, 907! 1176! 1342! 1533! 1639! 2073! *Wray*, 1985! 2513! 2770! 3068! *Kunstler* 3630! 6419! 7638! 7757! 7919! 10062! 10395! 10850! Pahang; *Ridley* 2456! 2458! Singapore; *Anderson! Kurz! Hullett!* Distrib. Sumatra, Java.

This species is very distinct from *D. sinuata* by reason of its much smaller, more numerous, and more closely set florets, which are as nearly as possible sessile; also on account of its very different pods which are shorter, much thinner, not sinuate between the seeds and are distinctly winged down both sutures. It is much more closely related to the last species from which it can be most easily distinguished by the absence of pedicels.

The synonym *Amerimum obovatum* is excluded because that plant is the same as *Pongamia obovata* Grah., reduced, with justice, to *Derris cuneifolia*. And the synonym *Pongamia* Wall. Cat. 9054 is also excluded, at least as a temporary measure, because Mr. Baker, in another passage, has referred it to *Spatholobus acuminatus*.

There are at Calcutta authentic examples, named by Dr. Miquel himself, both of *Aganope floribunda* Miq. and of *Derris pyrrothyrsa* Miq.; these are specimens of the same species, from Java and Sumatra respectively; they agree exactly with our specimens from the Malay Peninsula.

The variation in habit depends on whether the species is growing in open places or in dense forest.

§ 2. Brachypterum. Trees or climbers with comparatively small leaflets; flowers medium fasciculate on tumid nodes in axillary panicles: stamens monadelphous; base of vexillum without callosities; pod thin strap-shaped, narrow, pointed at both ends, winged only along the upper suture.

4. Derris scandens Benth. in. Journ. Linn. Soc. IV, Suppl. 103. A very large climber often exceeding 100 feet in length with branchlets at first obscurely grey downy; stems as thick as a man's wrist with very irregularly excentric annual rings. *Leaves* 4–6 in. long, dark green; leaflets 9–19, rigidly subcoriaceous obovate-oblong to oblong, acute rarely obtuse at apex, cuneate less often rounded at base, 2 in long, ·75 in. wide, polished and glabrous above, obscurely adpressed

grey-pubescent, dull beneath; rachis 2·5–4 in. long, grooved above, glabrous as are the petiolules ·2 in. long. *Flowers* in very long copious short-peduncled axillary racemes, sometimes 15–18 in. in length, with distant tumid nodes sometimes produced into short branches each bearing a cluster of unequal slender pedicels ·15–·25 in. long, the various flowers from one node expanding successively, rachis and pedicels finely adpressed-pubescent, the pedicels 2-bracteolate under the calyx, the bracteoles ovate minute. *Calyx* ·12 in. long, thinly silky, wide-campanulate, teeth obscure. *Corolla* white to pale-rose, ·35 in. long. *Stamens* monadelphous. *Ovary* finely puberulous; ovules 6–8. *Pod* 1–3 in. long, ·4–·5 in. wide, narrowed to both ends, narrowly winged along the upper suture, 1–4 seeded, uniformly finely adpressed grey-silky, somewhat turgid against the seeds. Bak. in Flor. Brit. Ind. II, 240. *Dalbergia scandens* Roxb. Cor. Pl. II, t. 192; DC. Prodr. II, 417; Wall. Cat. 5857; Roxb. Flor. Ind. III, 232; W. & A. Prodr. 264; Wight, Ic. t. 275. *Dalbergia timorensis* DC. Prodr. II, 417. *Pongamia coriacea* Grah. in Wall. Cat. 5905. *Brachypterum scandens* Benth. in Ann. Wien. Mus. II, 101; Miq. Flor. Ind. Bat. I, 138. *Brachypterum timorense* Benth. in Miq. Pl. Jungh. 253; Miq. Flor. Ind. Bat. I, 138.

ANDAMANS; very common everywhere. NICOBARS: plentiful. PENANG; *Curtis* 979! PAHANG: *Ridley* 2639! DISTRIB. South-Eastern Asia to North Australia, general.

Mr. Baker has described the pod as glabrous; it never becomes quite glabrous even when ripe. Though the name *Derris scandens* is most generally used for this species, it has to be pointed out that, so soon as *Deguelia* is recognised to be the best generic name, this species will have to be known as *Deguelia timorensis* Taub. (*Natür. Pflanzenfam.* III, 3. 345) because *Deguelia scandens* is the original name for the American plant at present known as *Derris guianensis* Bth. The genus was published under the name *Deguelia* before it was published under the name *Derris*.

5. DERRIS DALBERGIOIDES Bak. in Flor. Brit. Ind. II, 241. A spreading tree 30–40 feet high; branchlets silky-pubescent. *Leaves* 6–8 in. long by 1·5–2 in. wide, leaflets 25–39, linear rounded-obtuse at both ends slightly oblique at the base the apex slightly emarginate, 1 in. long, ·35 in. wide, firmly papery, adpressed pubescent on both sides, dark-green above paler beneath, lateral nerves 7–8 pairs, indistinct, rachis 5–6 in. long and petiolules ·1–·15 in. rusty-pubescent. *Flowers* in copious short-peduncled axillary racemes 3–6 in. long very rarely exceeding the leaves, about ·65–·75 in. wide with crowded tumid nodes each bearing a dense cluster of unequal short pedicels ·1 in. long or less, the various florets of a node expanding successively, rachis and pedicels brown silky-pubescent, the pedicels 2-bracteolate under the calyx, the bracteoles linear ·08 in. long. *Calyx* ·15 in. long, densely brown-silky, shortly but distinctly toothed, the teeth deltoid the lower subequal, the

two upper somewhat united. *Corolla* rose-purple, ·45 in. long, standard oblong, base cordate 2-glandular. *Stamens* monadelphous. *Ovary* densely pubescent, ovules 5–8. *Pod* 1–5-seeded narrowed to both ends 1–2·5 in. long, winged along the upper suture.

Perak; very common, *Scortechini* 1995! *Ridley* 3024! *Kunstler* 3039! 5805! Patani; *Machado* 5812! Malacca; *Maingay* 603! *Derry*, 138! 488! *Goodenough* 1829! Distrib. Tenasserim and Martaban.

None of the large suites of specimens sent to Calcutta has fruit; Mr. Baker describes the pod as exactly like that of *D. robusta;* he however describes *D. robusta* as having a glabrous pod which is never the case. Further Mr. Baker has described the leaflets of this species as 'glabrous' and on this account Father Scortechini has proposed for the Perak plant the name *D. dalbergioides* var. *dasyphylla*, to be distinguished by its pubescent leaflets from Mr. Baker's plant. The leaves of the original specimens collected by Parish and Maingay have, however, leaflets pubescent on both surfaces exactly as in the Perak plant.

§ 3. Euderris. Robust climbers with medium to large leaflets; flowers rather large fasciculate on tumid or produced nodes in axillary panicles; stamens monadelphous; base of vexillum without callosities; pod thin, broadly oblong or suborbicular, obtuse, winged only along the upper suture.

6. Derris uliginosa Benth. Pl. Jungh. 252. A widely spreading shrubby climber sometimes 40 feet long, with glabrous branches; stems 2–3 in. in diam. *Leaves* 5–8 in. long, leaflets usually 5, but very often 3, casually solitary, the terminal exceeding the others, rigidly subcoriaceous, ovate, acuminate or caudate-acuminate, base always rounded, 3–5 in. long, 1·5–2·5 in. wide, polished above quite glabrous on both surfaces, lateral nerves 7–8 pairs, very faint, looping at their ends some way within margin, bright green above paler beneath, rachis 2–5 in. long, channelled above and glabrous as are the petiolules ·25 in. long, secondary nerves indistinct. *Flowers* in rather short showy axillary racemes, 3–5 in. long, with nodes produced into short stalks each bearing one or several subequal pedicels the flowers of a fascicle opening subsimultaneously, rachis and pedicels glabrous, the node-stalks ·15 in., the pedicels proper as long, bracteolate at base and again 2-bracteolate a little below the calyx. *Calyx* ·15 in. long, subglabrous except the shortly ciliate subtruncate margin, rather wide-campanulate. *Corolla* delicate rose-pink, ·4 in. long, standard orbicular base subcordate eglandular. *Stamens* monadelphous. *Ovary* finely puberulous, ovules 5–7. *Pod* obliquely rounded-oblong 1–5 in. long, 1·75 in. across, glabrous, pale straw-colour when ripe, thin, flat, distinctly reticulately-veined; seed solitary, yellowish-brown, much compressed, 1 in. long almost as broad. Benth. in Journ. Linn. Soc. IV, Suppl. 107; Miq. Flor. Ind. Bat. I, 141; Bak. in Flor. Brit. Ind. II, 241. *Robinia uliginosa* Roxb.

ex Willd. Sp. Pl. III, 1133. *Galedupa uliginosa* Roxb. Hort. Beng. 53; Fl. Ind. III, 243. *Pongamia uliginosa* DC. Prodr. II, 416; Wall. Cat. 5879 (excl. E.); W. & A. Prodr. 262. *Pterocarpus uliginosus* Roxb. ex G. Don. Gen. Syst. II, 377.

In all the provinces, on the sea-coasts and on muddy tidal-river banks, common. DISTRIB. Sea-shores from Eastern Africa and the Mascarene Islands to Malaya and Western Polynesia.

Mr. Bentham would refer here *Derris Forsteniana* Bl. (*Miq. Flor. Ind. Bat.* I, 144); this hardly seems probable owing to Miquel's description of the leaves as having 3 pairs of leaflets. Mr. Baker would also refer here *Dalbergia heterophylla* Willd. (*Sp. Pl.* III, 901). but this again is very improbable for *D. heterophylla* has, according to the original description, obtuse leaves, which *Derris uliginosa* never has; as, also, racemes longer than the leaves, which those of *D. uliginosa* never are.

7. DERRIS ELEGANS Benth. Pl. Jungh. I, 252. A rather slender creeper sometimes 60 feet long, with brown pubescent branchlets. *Leaves* 8–12 in. long, dark-green, leaflets 5 (very rarely 3 or 7) the terminal exceeding the others, rigidly subcoriaceous, from oblong to lanceolate, base always somewhat rounded, 3–8 in. long, 1·5–4 in. wide, glabrous above, when young rusty-pubescent (sometimes persistently so) beneath, rachis rusty-pubescent 4 in. long, petiolules glabrescent ·2 in. long with rigid subulate stipels ·1 in. long, lateral veins 6–8 pairs prominent like midrib beneath. *Flowers* in solitary or fascicled axillary racemes 2–3 in. long, always much shorter than the leaves, nodes bracteate tumid but not produced into stalks, each bearing one or several subequal pedicels, rachis and pedicels rather densely villous with spreading rusty pubescence, the pedicels filiform ·35 in. long with 2 linear bracteoles a little below the calyx. *Calyx* ·15 in. long, black purple, sparsely pubescent, margin subtruncate. *Corolla* pure-white with pink tips, ·4–·5 in. long, standard orbicular-oblong tapering at base eglandular. *Stamens* monadelphous. *Ovary* softly villous, ovules 2–4. *Pod* obliquely rounded-oblong or oblong 1·5 (rarely 2·5 in.) long, 1 in. wide, thin, flat, distinctly reticulated, covered throughout with a fine sparse pubescence; seeds 1, rarely 2, much compressed ·75 in. in diam.

VAR. *typica;* leaflets ovate to lanceolate, acute, becoming at length subglabrous beneath, flowers ·5 in. long. *Derris elegans* Benth. Pl. Jungh. I, 252; Journ. Linn. Soc. IV, Suppl. 109; Bak. in Flor. Brit, Ind. II, 242. *Pongamia elegans* Grah. in Wall. Cat. 5883. *Pongamia floribunda* Grah. in Wall. Cat. 5884. *Leguminosa* Wall. Cat. 7540.

ANDAMANS; *King's Collectors!* PERAK; *Kunstler* 1419! 3911! DISTRIB. Tenasserim and Martaban; Sumatra (*Forbes!*)

VAR. *vestita*; leaflets oblong-acuminate to ovate-acute, densely persistently rusty-velvety beneath, flowers rather smaller ·4 in. long. *D. vestita* Bak. in Flor. Brit. Ind. II, 242.

Malacca; *Maingay* 608! Perak; *Scortechini* 1758! *Kunstler* 2775! 4014! 5583! 7398! Distrib.; Tenasserim.

The only differences between the two plants are in the points noted; their fruits are identical. The species is evidently closely related to *D. uliginosa* and has very similar pods; these however are always rather narrower in proportion to their length and further differ in occasionally being 2-seeded. But the inflorescence differs in the two in that the nodes of *D. elegans* are not produced; and the leaves differ markedly from those of *D. uliginosa* in shape, and as to pubescence. The most striking peculiarity of *D. elegans* is however the presence of stipels, a feature most unusual in *Derris*, but equally manifest in both varieties.

§ 4. Dipteroderris. Robust climbers with large leaflets, flowers medium on tumid or produced nodes in terminal and axillary panicles; stamens monadelphous, base of vexillum without callosities; pod winged down both sutures.

8. Derris andamanica Prain. A strong climber with fulvous or tawny-pubescent branches. *Leaves* 10–16 in. long; leaflets pale-green 7–9 (rarely 5) coriaceous, oblong or elliptic shortly cuspidate, base rounded, 5–6 in. long 2–3 in. wide, glabrous on both surfaces, lateral nerves 8–10 pairs spreading faint below not visible above except in young leaves, secondary veining fine, rachis 6–12 in. long glabrous as are the petiolules ·25 in. *Flowers* in ample terminal and axillary panicles, the branches rather numerous ascending 5–8 in. long, nodes tumid or produced into short stalks sometimes ·75–1 in. long, bearing several unequal filiform pedicels either clustered at their tips or scattered throughout their extent, rachis and branches pale tawny-pubescent, pedicels puberulous ·2–·3 in. long exceeding the calyx, bracteate at their base and 2-bracteolate under the calyx. *Calyx* wide-campanulate ·12 in. long, densely silky, green, margin subentire. *Corolla* white ·6 in. long, standard orbicular, base ecallose shallow-cordate. *Stamens* monadelphous. *Ovary* finely pubescent; ovules 4. *Pod* finely tawny-silky, thin, strap-shaped, 3–4 in. long, 1 in. wide, winged subequally along both sutures, wings ·12 in. wide; seeds 1–3. *Derris sinuata* Prain in Journ. As. Soc. Beng. LX, 2, 311 not of Benth.

Andamans; from Coco Group southwards; common on the coasts. Nicobars; common.

This fine species has not, so far, been collected outside the limits of the Andamans and Nicobars. Originally referred in the Calcutta Herbarium to *Derris sinuata*, recent and fuller suites of specimens now show that its nearest alliance is with the South Indian *D. eualata* Bedd., but it has longer pedicels and smaller bracteoles than has that species, and has a silky pod.

9. Derris affinis Benth. Pl. Jungh. 252. A climber with pale-brown lenticular glabrous branches. *Leaves* 6 in. long, pale-green, leaflets 5 subequal, firmly chartaceous, ovate-acute base rounded, 2·5 in.

long, 1·25 in. wide, glabrous on both surfaces, lateral nerves 10 pairs prominent on both sides running almost to margin of blade, rachis 3·5 in., glabrous as are the petiolules ·2 in. long. *Flowers* in lax axillary panicles 6–8 in. long, sparingly branched, branches 2·5 in. long or less, spreading, nodes tumid but not produced into stalks, bearing one or more unequal filiform pedicels, rachis and pedicels sparsely adpressed-puberulous, the pedicels ·2 in. long rather longer than the calyx, bracteate at their base, 2-bracteolate close under the calyx. *Calyx* campanulate ·12 in. long, subglabrous, purplish, margin sinuate-toothed, *Corolla* apparently white, ·35 in. long, standard orbicular ecallose. *Stamens* monadelphous. *Ovary* sparsely hairy; ovules about 4. *Derris uliginosa* VAR. *Loureirii* Benth. in Journ. Linn. Soc. IV, Suppl. 108 in part. *Pongamia uliginosa* Wall. Cat. 5879 (E only) not of DC.

PENANG; *Wallich!*

Nearly related to *D. marginata* Bth. from which it differs mainly in having shorter pedicels 2-bracteolate close under the calyx, and in having rather smaller leaflets with more numerous nerves. It seems also very nearly related to the next species from which it differs in its shorter panicles and its leaflets with more numerous and more prominent nerves. It is besides nearly related to *D. amœna* but differs in having thinner leaves, and laxer panicles with spreading not fastigiate branches.

10. DERRIS FLORIBUNDA Benth. Journ. Linn. Soc. IV, Suppl. 105. A stout rambling shrub with glabrous whitish branches. *Leaves* 4–5 in. long, leaflets 3–5, pale-green, thinly coriaceous, broadly elliptic-oblong, base rounded, apex shortly and obtusely acuminate, 2–2·5 in. long 1–1·5 in. wide, glabrous on both surfaces, lateral nerves 4 pairs very faint beneath not visible above, rachis 3–4 in. long, glabrous as are the petiolules ·25 in. long. *Flowers* in long lax axillary panicles sometimes 15–18 in. long, sparingly branched, the branches 4–6 in. long, spreading, nodes distant tumid, sometimes produced into stalks bearing 2–6 unequal filiform pedicels, rachis and pedicels sparsely spreading-puberulous, the pedicels ·4 in. long, 2-bracteolate at base of calyx. *Calyx* campanulate ·12 in. long, purple-brown, margin crenate. *Corolla* white, ·3 in. long. standard orbicular ecallose with a green spot above the long claw. *Stamens* monadelphous. *Ovary* sparsely puberulous, ovules 2–3. *Brachypterum floribundum* Miq. Flor. Ind. Bat. I, 139.

PERAK; Larut, *Scortechini* 2180! DISTRIB. Java.

The Perak specimens have pedicels rather more glabrous than the Java ones; otherwise they agree very closely. Miquel refers the plant doubtfully to *Brachypterum*; to the writer it seems as if its affinities were rather with *Dipteroderris*; unfortunately the pod is still unknown. The Perak plant is 2-ovuled, the Java one 3-ovuled, in all the flowers examined by the writer.

11. DERRIS AMŒNA Benth. Pl. Jungh. 252. A large glabrous climber reaching 50 feet, with black branches. *Leaves* 6–8 in. long,

leaflets bright-green, 7 (sometimes 9, rarely 5), rigidly subcoriaceous to coriaceous, ovate-oblong cuspidate, base rounded to cuneate, 2–4 in. long, 1–2 in. wide, glabrous on both surfaces, lateral nerves numerous parallel spreading indistinct beneath visible above, rachis 4–6 in., glabrous as are the petiolules ·25 in. long. *Flowers* in rather dense, fastigiately branched, axillary panicles 6–9 in. long, lower branches almost equalling main-rachis, nodes rather close often produced in short stalks bearing usually 3 unequal filiform pedicels, rachis and pedicels glabrous, the pedicels ·25 in. long, 2-bracteolate a short distance below calyx. *Calyx* campanulate ·12 in., glabrescent, mouth sinuately-toothed. *Corolla* pink (*Ridley*) or purple (*Kunstler*), ·3 in. long, standard orbicular ecallose. *Stamens* monadelphous. *Ovary* sparsely puberulous; ovules usually 2. *Pod* thin glabrous ligulate-oblong flexible finely veined, 3–4 in. long, 1–1·5 in. wide, upper wing ·25 in. wide, lower narrow; seeds usually 2, sometimes solitary.

Var. *typica;* leaves rigidly subcoriaceous green beneath. *D. amœna* Benth. Journ. Linn. Soc. IV, Suppl. 110; Bak. in Flor. Brit. Ind. II. 245. *Pongamia amœna* Wall. Cat. 5912.

Perak; *Kunstler* 1381! *Scortechini* 1736! Malacca; *Maingay!* Distrib. Tenasserim.

Var. *Maingayana;* leaves coriaceous glaucous beneath. *Derris Maingayana* Bak. in Flor. Brit. Ind. II, 245.

Malacca; *Derry!* Singapore; *Maingay! Hullett! Ridley* 6402!

It seems impossible, now that large suites of specimens have been sent from Malacca by Mr. Derry, to treat these two plants as more than varieties of one species. Mr. Derry gives two local names for his plant, '*Aker-tuba-tuba*' and '*Aker-pakidah*.'

§ 5. Paraderris. Robust climbers with large leaflets, flowers large on usually produced nodes in axillary panicles; stamens monadelphous; base of vexillum with two callosities extending along the claw; pod winged down the upper suture.

12. Derris elliptica Benth. Journ. Linn. Soc. IV, Suppl. 111. A large climbing shrub 20–30 feet long with black warted branches and rusty-pubescent young shoots. *Leaves* 9–15 in. long, dull greyish-green, leaflets 9–13 subequal, at first membranous, with age subcoriaceous, oblong to oblanceolate-oblong cuspidate, 3–6 in. long, 1–1·3 in. wide, pubescent beneath, at first puberulous at length glabrous above, rachis 6–9 in. long, rusty-pubescent faintly grooved above, petiolules ·2 in. long rusty-pubescent, lateral veins 8–10 pairs prominent beneath as is the midrib. *Flowers* in copious lax axillary racemes 9–10 in. long, never exceeding the leaves, nodes produced into distinct stalks ·3–1·3 in. long, each bearing one or more (usually 3) subequal pedicels, rachis and

pedicels densely rusty-tomentose the pedicels slender ·25 in. long, bracteolate at their bases and 2-bracteolate under the calyx. *Calyx* ·25 in., densely rusty-pubescent, wide-campanulate the mouth sinuately subtruncate. *Corolla* from pure white (*Scortechini*) to white with pink tinge (*Kunstler*) or dull pink (*Wray*), ·65 in. long, standard densely silky on the back, orbicular with rounded 2-callose base. *Stamens* monadelphous. *Ovary* vilious, ovules usually 4 (sometimes 3, rarely 5). *Pod* oblong to lanceolate, 1–4-seeded, 1·5–3·5 in. long, ·75 in. wide, distinctly winged along upper, faintly along lower suture. Bak. in Flor. Brit. Ind. II, 243. *Galedupa elliptica* Roxb. Hort. Beng. 53; Flor. Ind. III, 242. *Pongamia elliptica* Wall. Pl. As. Rar. III, 20, t. 237; Cat. 5881; Wight, Ic. t. 420; Miq. Flor. Ind. Bat. I, 148. *Pongamia dubia* Grah. in Wall. Cat. 5899. *Pongamia volubilis* Zoll. & Mor. Syst. Verzeichn. 3; Miq. Flor. Ind. Bat. I, 148. *Millettia pachycarpa* Bak. in Flor. Brit. Ind. II, 106 in part (*as to the Malacca locality*).

Malacca; *Griffith! Maingay!* Perak; *Scortechini* 1738! *Wray* 1678! 1695! 3323! *Kunstler* 1431! Distrib. Northwards through Tenasserim to Chittagong; southwards through Sumatra to Java.

Mr. Wray gives '*Aker-tuba*' as the Malay name of this species. It has a true *Derris* pod but differs markedly from the other species by its standard silky on the outside. When they are only in flower and the leaves of both are still young it is very difficult without careful examination to distinguish this species from *Millettia pachycarpa*. This is Zollinger's *Pongamia volubilis* of which there are authentic specimens at Calcutta; it is also said by Mr. Bentham to be the same as *P. Horsfieldii* Miq. and *P. hypoleuca* Miq.; neither of these is represented in *Herb. Calcutta*.

13. Derris malaccensis Prain. A rather slender creeper 30–50 feet long with glabrous branches. *Leaves* 9–15 in. long, bright-green, leaflets 5–7 (rarely 9), subequal, subcoriaceous, elliptic, base rounded apex caudate-acuminate, 4–6 in. long 2–2·5 in. wide, the caudate tip ·35–·6 in. long, glabrous on both surfaces, rachis 6–8 in. long, glabrous hardly grooved above, petiolules ·25 in. glabrous, lateral veins about 5 pairs indistinct. *Flowers* in solitary axillary racemes 4–6 in. long always much shorter than the leaves, nodes produced in stalks ·15–·2 in. long each bearing one or several subequal pedicels, rachis and pedicels glabrescent, the pedicels filiform ·25 in. long bracteolate at base and with 2 small lanceolate bracteoles very near base of calyx. *Calyx* ·15 in. long reddish, wide-campanulate, glabrous except the ciliate slightly sinuate margin. *Corolla* white or yellow tinged with pink, ·65 in. long, standard orbicular truncate or subcordate at the 2-callose base. *Stamens* monadelphous. *Ovary* densely rusty-pubescent; ovules 4–5. *Pod* oblong winged or not, glabrous, 1–4-seeded, 2–3 in. long.

Var. *typica;* pod 1·5 in. wide, winged along the upper suture, sometimes along both. *Derris cuneifolia* var. *malaccensis* Benth. Journ. Linn. Soc. IV, Suppl. 112.

Pekak; Larut, Goping, etc. *Kunstler* 4028! 4149! 4504! 8551! *Scortechini* 110! Malacca; *Griffith* 1774! Singapore; *Ridley!* Distrib. Tenasserim; Borneo.

Var.? *aptera;* pod 1 in. wide, wingless; leaflets with lateral veins stronger beneath.

Malacca; *Maingay* 613! Perak; *Kunstler* 4518! 6428!

Var.? *millettioides*; pod and leaflets as in var.? *aptera* but the former usually longer and ultimately dehiscing (as in *Millettia*) along both sutures.

Perak; Ulu Bubong, *Kunstler* 10696!

The plant here described as *Derris malaccensis* is extremely closely related to *D. cuneifolia* of which indeed it was treated by Mr. Bentham as a variety. Its leaves differ mainly in having fewer but larger leaflets with long caudate-acuminate tips; the flowers, too, are considerably larger and of a somewhat different colour: the pods of *D. malaccensis* are also much larger than those of *D. cuneifolia*. It must also, from the description of that plant, be very nearly allied to *D. montana* Benth. (*Pl. Jungh.* 253) a Java species not represented in Herb. Calcutta. The foliage of the two is evidently almost identical but the flowers are a little larger in *D. montana*, being ·75 in. long. *D. malaccensis* is thus evidently intermediate between *D. cuneifolia* and *D. montana* as regards its petals; it is likewise intermediate as regards ovary. Mr. Bentham ascribes two ovules to *D. cuneifolia* and this is almost always the case; in one or two flowers, however, three ovules have been found; Mr. Baker indeed says that the pod of *D. cuneifolia* may be 3-seeded,—this no Calcutta specimen shows. To *D. montana* Mr. Bentham ascribes "about 8 ovules;" *D. malaccensis* has had, in almost every flower examined, 4 ovules and in some pods it has 4 seeds; one or two ovaries with 5 ovules have been met with, but never more than 5 have been seen.

The plants named var.? *aptera* and var.? *millettioides* are placed here merely for convenience of reference. They are both reported in fruit only, and as they have almost exactly the leaves of *Derris malaccensis* it seems better for the present to refer to them under that species. As regards var.? *aptera* indeed this is the more essential since two gatherings from Perak (*Wray* 2025! *Kunstler* 3190!), and one from Penang (*Curtis* 2735!) have pods intermediate between those of var.? *aptera* and those of *D. malaccensis*. The pods of var.? *aptera* are, however, obviously those of a *Pongamia* rather than those of a *Derris*, if *Pongamia* be really entitled to a separate generic position, which the writer hardly believes. The distinguishing character is a quite artificial and, as these very plants show, a somewhat inadequate one.

The existence of var.? *millettioides* raises an even more troublesome question, the relationship of *Millettia* to *Derris*. The arrangement adopted in the *Genera Plantarum*, the *Histoire des Plantes* and the *Natürlichen Pflanzenfamilien* places *Derris* and *Pongamia* among the *Dalbergieæ* and *Millettia* among the *Galegeæ*. This then, considering the great authority of the authors who have sanctioned it, must be accepted as the most natural arrangement possible. That a more *inconvenient* one could hardly be devised has, however, been the experience of most field botanists and of most authors who have had to deal with the species belonging to the genera. For these genera are so closely allied that they only differ, and that merely

'on paper,' in the "tardy dehiscence" of the pod in *Millettia*, its "indehiscence" in *Pongamia* and *Derris*. As a matter of fact Mr. Bentham has placed in *Derris* a species (*D. microptera*) the pods of which dehisce, while Mr. Kurz has placed in *Millettia* a species (*M. monticola*) that has the pods of a *Derris*. No taxonomist, however able, can venture in the absence of fruit to do more than suggest to which of the three genera a particular species should be referred. A fourth genus to which similar remarks apply is *Lonchocarpus*; this only differs from species of *Derris* that have thin pods, exactly as *Pongamia* differs from species of *Derris* that have turgid pods, in having sutures without wings. It is, moreover, a suspicious fact that Koorders and Valeton (*Bijdr.* II,) find the same difficulty in separating *Pongamia* from *Millettia*.

In the works of Roxburgh and of Wight and Arnott, also in Bentham's account of the *Leguminosæ* in *Plant. Junghuhn.*, *Millettia* was not divorced from *Derris* and its allies; Miquel and Kurz, too, continued to place the genera side by side. And certainly if they have adopted the less natural method of arrangement, it cannot be denied that, in so doing, these authors have retained a much more convenient one.

29. Kunstleria Prain.

Woody climbers with unequally pinnately 1–7-foliolate exstipellate leaves; stipules small, deciduous. *Flowers* rather small in ample terminal thyrsoid panicles extending into the axils of the upper leaves; pedicels solitary, nodes not tumid. *Calyx* campanulate, teeth lanceolate the two upper connate. *Corolla* distinctly exserted; standard ovate entire; keel boat-shaped the petals slightly cohering. *Stamens* diadelphous the upper one quite free from the other 9 and adnate at base to standard claw; anthers versatile uniform on alternately short and long free filaments. *Ovary* sessile, few-ovuled; style incurved filiform, stigma capitate. *Pod* thin flat strap-shaped membranaceous or coriaceous, indehiscent, style terminal, sutures not winged. *Seeds* 1–3, much compressed, oblong; radicle inflexed. Species 5, Malayan.

This interesting genus possesses the habit of *Spatholobus* with the calyx and almost the corolla and stamens of that genus. It differs, however, in having its flowers solitary in place of fascicled on tumid nodes; in having exstipellate leaflets varying in number in different species from 1–7; and in having the pod quite indehiscent with the seeds centrally not terminally situated, in this last character being indistinguishable from *Lonchocarpus*. From *Lonchocarpus* however *Kunstleria* differs in having the flowers unfascicled, in having the calyx toothed, and in having the stamens diadelphous. As regards inflorescence *Kunstleria* agrees exactly with *Derris* § *Aganope* and agrees moreover with that group of species in having the vexillary stamen free. But here again *Kunstleria* differs in having a wingless pod and a toothed calyx, and in having the free stamen adnate to the standard claw. With the calyx of *Spatholobus* then, we have associated in *Kunstleria* the inflorescence of *Aganope* and the pod of *Lonchocarpus*.

The genus is dedicated to the memory of Herr H. H. Kunstler, one of the most enthusiastic, as he was one of the most painstaking and faithful of the collectors who have laid down their lives in the cause of science in the tropics.

Leaflets solitary, with petiolules attached slightly within margin of lamina :—

Leaflets and petioles glabrous on both surfaces ... ... 1*a*. *K. Curtisii.*

Leaflets and petioles subscabridly pubescent ... ... 1*b*. *K. Curtisii* VAR. *laxiflora.*

Leaflets several, with petiolules attached to margin of lamina :—

Leaves 3-foliate, (leaflets and petioles glabrous ; pods narrower than in the other species of which pods are known) ... 2. *K. Kingii.*

Leaves 5-foliate :—

Leaflets thickly coriaceous, densely ferruginous underneath 3. *K. Forbesii.*

Leaflets chartaceous, glabrous on both surfaces... ... 4. *K. Ridleyi.*

Leaves 7-foliate, (leaflets and petioles subscabridly pubescent) 5. *K. Derryi.*

1. KUNSTLERIA CURTISII Prain. A shrubby climber with slender branches; bark brownish lenticular. *Leaves* 5–8 in. long, leaflet 1, ovate-lanceolate 4–6·5 in. long, 2·5 in. wide, apex acute base rounded, lateral nerves ascending 4–5 pairs rather prominent as is the midrib beneath, margin entire ; rigidly chartaceous, pale-green ; petiole ·75–1·5 in. long, petiolule ·25 in. subpeltately attached. *Flowers* in copious terminal and axillary panicles 8–12 in. long, 5–8 in. across, rachis and branches rusty-pubescent ; pedicels pubescent ·08 in. long. *Calyx* campanulate densely pubescent, ·15 in. long, teeth triangular except the upper broadly deltoid bifid at tip half as long as tube. *Corolla* apparently purple, ·25 in. long, standard ovate-oblong. *Pod* thin flat densely rusty-pubescent, 5 in. long 1 in. wide, 2–3 seeded.

VAR. *typica ;* leaves above and petioles glabrous, leaves beneath and petiolules sparsely adpressed-pubescent with whitish hairs ; rachis and branches of panicles sparsely rusty-pubescent ; pods distinctly reticulated.

PENANG ; at Tulloh Bahang, *Curtis* 3019 !

VAR. *laxiflora ;* leaves on both surfaces subscabridly, petioles and petiolules densely softly pubescent with rusty tomentum, as are the rachis and branches of the laxer more spreading panicles ; pods more densely velvety not visibly reticulated.

PANGKORE ; Tulloh Sera, *Curtis* 1632 !

The calyx and corolla, so far as the limited material goes, are not distinguishable in these two plants. The measurements of pod given are taken from fruits of the typical variety ; the pods of the other are much smaller but are apparently not so far advanced. When fuller material of these two plants is available it may be necessary to consider them specifically distinct ; on the other hand their leaves, but for the different pubescence, are quite similar and it may prove unnecessary to separate them even as varieties.

2. KUNSTLERIA KINGII Prain. A very extensive climber over 100 feet long, with slender branches ; bark brown lenticular. *Leaves* 5–8 in. long, leaflets 3 ovate-lanceolate 4–6 in. long, 1·5–2 in. wide, apex acute,

base of lateral leaflets rounded, of central rather the larger shortly cuneate, lateral nerves ascending 5–6 pairs rather prominent as is the midrib beneath, margin entire; firmly chartaceous pale-green glabrous on both surfaces, petiole glabrous 1·5–2·5 in. long, petiolules glabrous ·2 in. marginally attached. *Flowers* in copious terminal and axillary panicles 8–12 in. long, 5–8 in. across, rachis and branches rusty-pubescent; pedicels pubescent ·08 in. long. *Calyx* campanulate densely pubescent ·15 in. long, teeth triangular except the upper broadly deltoid bifid at tip almost as long as tube. *Corolla* dark-purple, ·25 in. long, standard oblong. *Pod* thin flat densely brown-pubescent and distinctly reticulated, 2–4 in. long, ·6 in wide, 1–2 seeded, seeds oblong 1·25 in. long, ·5 in. wide, cotyledons thin and leaf-like, testa very dark brown.

Perak; Larut, *Kunstler* 3830! 6870! 6935!

Among the many specimens sent by Mr Kunstler only one has a leaf with a solitary leaflet, all the other leaves are 3-foliolate. The individual leaflets are extremely like those of typical *K. Curtisii* and only differ in not being slightly peltate and in being hardly so thick; the pods however are very different.

3. Kunstleria Forbesii Prain. A small shrubby climber 6–10 feet long, with densely rusty-pubescent branches. *Leaves* 8–10 in. long, leaflets 5 elliptic, 3·5–5 in. long, 2–2·5 in. wide, terminal rather exceeding the others, bases of all rounded, apex rounded shortly abruptly acuminate, lateral nerves spreading, 6–9 pairs, rather prominent as is the midrib beneath, margin entire; rigidly coriaceous dark-green subscabrid above densely rusty velvety beneath, petiole rusty-puberulous 3·5 in. long, petiolules ·25 in. densely rusty-pubescent. *Flowers* in rather strict terminal and axillary panicles 12–18 in. long 5–6 in. wide, rachis and branches densely rusty-velvety, as are the very short pedicels and lanceolate bracts ·1 in. long. *Calyx* campanulate, densely rusty-velvety, ·15 in. long, teeth lanceolate except the triangular slightly bifid upper almost as long as tube. *Corolla* deep lake-red, ·25 in. long, standard oblong. *Pod* not seen.

Perak; Salama, *Kunstler* 3094! Distrib. Sumatra (*Forbes* 3241!).

4. Kunstleria Ridleyi Prain. A climber with slender puberulous branches. *Leaves* 6–8 in. long, leaflets 5 elliptic, 2–3·5 in. long, 1·25–2 in. wide, terminal considerably larger than the others, bases of all narrowly truncate, apex tapering to a finally somewhat abrupt blunt point, lateral nerves ascending, 5–6 pairs, rather prominent as is the midrib beneath; margin entire, firmly chartaceous pale-green glabrous on both surfaces, petiole sparsely pubescent 2–3 in. long, petiolules rusty-pubescent, ·2 in. long, marginally attached. *Flowers* in rather strict terminal and axillary panicles 12–18 in. long, 4–5 in. across, rachis and branches sparsely rusty-pubescent; pedicels very short, and subulate bracts ·08 in.

long, densely rusty. *Calyx* campanulate densely rusty, ·15 in. long, teeth triangular except the broadly deltoid slightly bifid upper, rather more than half as long as tube. *Corolla* ·25 in. long, standard broadly ovate. *Pod* thin flat densely rusty-pubescent and distinctly reticulated, 6 in. long 1·25 in. wide.

Singapore; *Ridley*, 6395!

A very distinct species, in inflorescence most resembling *K. Forbesii* but with leaves of the consistence and appearance of those of *K. Kingii*, though with 5 leaflets in place of 3. The pod however is very different from that of *K. Kingii*, and resembles that of *K. Curtisii*, the chief difference being that the meshes of the reticulations on the valves are much opener in *K. Ridleyi* than in *K. Curtisii*.

5. Kunstleria Derryi Prain. A climber with densely pale-rusty pubescent branches. *Leaves* 6–8 in. long, leaflets 7, ovate-lanceolate, 1–3 in. long ·75–1·5 in. wide, terminal with deltoid base considerably exceeding the lateral with rounded bases, all with cuneate apex, lateral nerves ascending 6–7 pairs, rather prominent as is the midrib beneath, margin entire; rigidly chartaceous pale-green subscabridly pubescent on the nerves above, uniformly subscabrid beneath as are the petioles 2·5–3 in., and the marginally attached petiolules ·2 in. long. *Flowers* in rather strict terminal and axillary panicles 12–15 in. long 2–3 in. wide, rachis and branches softly pale-rusty as are the very short pedicels and the very small lanceolate bracts. *Calyx* campanulate, densely rusty-pubescent, ·15 in. long, teeth triangular, upper rather broader, notched, half as long as tube. *Corolla* dark-purple ·25 in. long, standard oblong. *Pod* not seen.

Malacca; Machap Tebung Road, *Derry* 1006!

Leaves and branches with exactly the pubescence of *K. Curtisii* var. *laxiflora* but with 7 leaflets instead of a solitary leaflet and with marginally, not subpeltately attached petiolules.

30. Dalbergia Linn. fil.

Trees or climbing shrubs. *Leaves* with alternate subcoriaceous leaflets. *Flowers* copious, small, in terminal or lateral panicles. *Calyx* campanulate; teeth 5, distinct, usually short. *Corolla* exserted; standard broad; keel obtuse, with its petals only joined at the tip. *Stamens* 9–10, monadelphous, the sheath split above, or diadelphous, the sheath split also down the keel; anthers minute, basifixed, with the cells back to back, and the slit mostly short and apical. *Ovary* stalked, few-ovuled; style short, incurved, glabrous, stigma capitate. *Pod* oblong or strap-shaped, usually thin and flat, 1–4-seeded, indehiscent, not thickened or winged at the sutures. Species 60–70, cosmopolitan in the tropics.

Stamens in two lateral phalanges of 5 filaments each, pod thin and flattened except opposite the seeds (§ *Dalbergaria*) 1. *D. volubilis.*

Stamens monadelphous :—

Pod thin and flattened except opposite the seed (§ *Sissoa*) [unknown in *D. Hullettii*] :—

Flowers contemporaneous with the leaves; climbing species :—

Standard narrow, claws of petals shorter than calyx tube :—

Pod very short-stalked; flowers ·25 in. long in panicles of congested corymbs (leaflets 1 in. or more in length) ... ... 2. *D. confertiflora.*

Pod distinctly stalked; flowers minute (·15–·2 in.) in lax corymbose cymes :—

Leaflets ·6–1·5 in. long; corymbs mostly terminal; ovary puberulous ... ... 3. *D. Junghuhnii.*

Leaflets ·2–·4 in. long; corymbs smaller axillary and terminal; ovary glabrous ... ... 4. *D. subsympathetica.*

Standard orbicular, claws of petals as long as calyx-tube :—

Leaflets rather numerous, membranous, not cuspidate :—

Leaflets 13–17, 1·5–2 in. long, oblong obtuse or subacute; racemes large spreading; calyx and leaves densely pubescent... ... ... 5. *D. velutina.*

Leaflets 25–41, ·6–·75 in. long, rhomboid retuse; racemes small congested; calyx and leaves thinly pubescent ... ... 6. *D. tamarindifolia.*

Leaflets few (1–5), large (2–4 in. long), firm, abruptly cuspidate ... ... 7. *D. pseudo-sissoo.*

Flowers preceding the leaves; a small tree, (claws of petals as long as calyx-tube) ... ... 8. *D. Hullettii.*

Pod uniformly thickened throughout the valves, the upper suture falcate at least when young (§ *Selenolobium*) :—

Pods flattened, reticulated, always 1-seeded, (upper suture recurved when ripe) :—

Leaflets usually 5, small (under 1 in. long), obovate-oblong obtuse; flowers many in congested panicles 9. *D. torta.*

Leaflets usually 3, large (3–3·5 in. long), ovate-lanceolate acute; flowers few in short spikes ... 10. D. *menoëides.*

Pods turgid, smooth, often 2-seeded :—

Upper suture recurved when ripe, pod puberulous; leaflets acuminate, large (4–6 in. long), prominently veined and when young densely pubescent beneath, thickly coriaceous ... ... 11. *D. Kunstleri.*

Upper suture convex like lower when ripe, pod glabrous; leaflets glabrous obtuse slightly emarginate, smaller (2–3·5 in. long), not prominently veined beneath, thinly coriaceous ... ... 12. *D. parviflora.*

§ 1. Dalbergaria. *Pod* thin and flattened except opposite the seeds. *Stamens* diadelphous in two lateral phalanges of 5 filaments each.

1. Dalbergia volubilis Roxb. Cor. Pl. II, 48 t. 191. A large woody climber, 40–60 feet high, with twining glabrescent branches here and there thickened and twisted into spiral hooks. *Leaves* 4–5 in. long, leaflets 11–13 obovate, or ovate-oblong rounded, obtuse or slightly retuse faintly mucronulate at apex, dark-green above paler beneath, glabrous on both surfaces, ·75–1 in. long ·5–·75 in. across; rachis 3–4 in. long and petiolules ·15 in. long, quite glabrous. *Flowers* in copious terminal and axillary panicles 8–12 in. long with glabrous peduncles and with numerous horizontal or decurved puberulous branches 1–3 in. long bearing corymbose cymes, ultimate corymbs densely congested; bracts at base of branches of panicle small ovate subpersistent; pedicels slender puberulous, lower ·2 in. long upper very short with a small lanceolate persistent bracteole at base and two small ovate ones embracing the lower fifth of calyx-tube. *Calyx* campanulate, densely puberulous ·1 in. long, teeth lanceolate lowest exceeding the others. *Corolla* pale-blue ·25 in. long, standard broadly orbicular emarginate, reflexed at junction of blade and claw. *Stamens* 10, in two lateral groups of 5 each. *Pod* distinctly stalked, linear-oblong obtuse membranous, 2–3 in. long, 1 in. wide; 1–2-seeded. Hort. Beng. 53; Fl. Ind. III, 231; DC. Prodr. II, 417; Wall. Cat. 5874; W. & A. Prodr. 265; Benth. in Journ. Linn. Soc. IV, Suppl. 46; Bak. in Flor. Brit. Ind. II, 235.

Andamans; very common. Distrib. Throughout India and Indo-China.

By an oversight this is described in the *F. B. I.* as having ebracteate pedicels; in reality each pedicel has three persistent bracteoles, one at its base, two at its apex.

§ 2. Sissoa. *Pod* thin and flattened except opposite the seeds. *Stamens* monadelphous.

2. Dalbergia confertiflora Benth. Pl. Jungh. 255. A large climber with sparsely puberulous, soon glabrescent branches. *Leaves* 4–6 in. long, leaflets firm 11–15, oblong obtuse or retuse, green and glabrous above paler and sparsely puberulous beneath, 1–1·5 in. long, ·5–·75 in. wide; rachis 3–4 in. long, glabrous as are the petiolules ·2 in. long. *Flowers* rather small in ample terminal and axillary panicles, 3–5 in. long, of corymbosely or subcapitately crowded cymes; peduncle and branches rather densely pubescent; bracts puberulous minute ovate deciduous; solitary bracteoles at base of pedicels also ovate deciduous; pair at base of calyx ovate-lanceolate persistent embracing lower fifth of calyx-tube. *Calyx* ·15 in. long, pubescent, rather narrowly tubular, teeth short obtuse, one-third as long as tube except the lower lanceolate half as long

as tube. *Corolla* white ·25 in. long, claws of petals short. *Stamens* 9 monadelphous. *Pod* thin glabrous, 2–3 in. long ·75–1 in. wide, 1–3-seeded, stalk very short. Benth. Journ. Linn. Soc. IV, Suppl. 41; Bak. in Flor. Brit. Ind. II, 233.

ANDAMANS; very common. DISTRIB. Eastern Himalaya, Assam, Chittagong, Pegu.

A very distinct species; the description of the pod given in the *Flora of British India* is apparently taken from another species.

3. DALBERGIA JUNGHUHNII Benth. Pl. Jungh. 254. A shrubby climber 15–30 feet long, with twining glabrous branches, here and there twisted and thickened into spiral hooks. *Leaves* 4–5 in. long, leaflets 7–15, oblong or elliptic, rounded at both ends faintly emarginate at the apex, green and glabrous above, glaucescent and glabrous or faintly puberulous beneath, ·6–1·5 in. long ·35–·75 in. wide; rachis 2·5–4 in. long, petiolules ·15 in. long. *Flowers* minute, secund in an ample terminal and in smaller axillary paniculate cymes 2 in. wide and as long as the leaves, peduncle branches and pedicels pubescent; bracts minute caducous; bracteoles all persistent, one at base of short pedicel lanceolate acuminate very minute, two at base of calyx ovate-obtuse embracing the lower third of calyx-tube. *Calyx* ·08 in. campanulate, teeth short obtuse one-third as long as tube, except the lower acute half as long as tube. *Corolla* white, ·15 in. long, claws of petals short. *Stamens* 9 monadelphous. *Ovary* pubescent. *Pod* thin membranous greenish, glabrous, 2·5–3 in. long, 1–1·3 in. wide, 1-seeded, slightly cuneate at base and distinctly stalked.

VAR. *typica;* leaflets usually 7–9, oblong, glabrous or only faintly puberulous beneath. *D. Junghuhnii* Benth. Journ. Linn. Soc. IV, Suppl. 33; Miq. Flor. Ind. Bat. I, 129; Bak. in Flor. Brit. Ind. II, 233.

PENANG; 500 feet, *Curtis!* MALACCA; *Maingay* 547! 547/2! *Goodenough! Derry!* SINGAPORE; *Hullett* 141! *Ridley*! DISTRIB. Sumatra, Java.

VAR. *Scortechinii* Prain; leaflets 11–15 elliptic, beneath more closely puberulous especially on midrib.

PENANG; Ayer Etam, *Curtis* 1437! MALACCA; Bijong, *Scortechini* 1830! *Maingay* 549! SINGAPORE; Bukit Timah, *Ridley* 6406! DISTRIB. Borneo.

These two plants differ in no way as regards flowers; the leaves however differ considerably in appearance and it may ultimately be found that the second variety—of which the fruit is as yet unknown—should be known as a distinct species, *Dalbergia Scortechinii*. The original specimens on which Mr. Bentham founded the species were collected by Junghuhn in Sumatra and by Griffith in Malacca; the writer has not seen either. Mr. Bentham describes the ovary as glabrous in his

specimens, it is hairy in all the specimens above cited where there are flowers. The most nearly related species are *D. subsympathetica*, which has much smaller leaflets with rather larger flowers in more numerous less ample cymes; and *D. sympathetica* which also has rather larger flowers and smaller leaflets. In *D. sympathetica* however the leaflets are more numerous and the pod though similar is more shortly stalked.

Mr. Bentham, who had not seen fruit of this when he wrote, suggested that this might prove to be the same as *D. parviflora* Roxb. One objection to this suggestion is the very small number of leaflets described by Roxburgh; a still more fatal objection, however, is in the pod; this Roxburgh describes as falcate,—an indication that *D. parviflora* should be sought for in § *Selenolobium* rather than in § *Sissoa*.

4. Dalbergia subsympathetica Prain. A tall climber 60–80 feet long, less often a scandent shrub or small tree 15–30 feet high, with twining puberulous branches. *Leaves* 1·5–3 in. long, leaflets 9–15 oblong, apex truncate or emarginate base wide-cuneate or rounded, green and glabrous above, paler and pubescent with long adpressed hairs beneath, ·25–·4 in. long, ·2–·3 in. wide; rachis 1–2·5 in. long, densely puberulous as are the petiolules ·1 in. long. *Flowers* minute secund, in small axillary paniculate cymes, ·75–1 in. across, as long as the leaves, peduncle ·5–·7 in., branches and pedicels pubescent; bracts minute caducous; bracteoles all persistent, one at base of short pedicel lanceolate, acuminate, very minute, two at base of calyx ovate-obtuse embracing lower fourth of calyx-tube. *Calyx* ·1 in. campanulate, teeth short obtuse one-third as long as tube, except the lower acute half as long as tube. *Corolla* white, ·2 in. long, claws of petals short. *Stamens* 9, monadelphous. *Ovary* glabrous except along anterior suture. *Pod* thin membranous greenish glabrous, 2·5 in. long, 1 in. wide, 1-seeded; slightly cuneate at base and distinctly stalked.

Penang; *Curtis* 1492! Perak; *Scortechini* 201! 1071! *Wray* 2086! 3205! *Kunstler* 2354! 3562! 4978! 5182!

Very near *D. Junghuhnii* and just possibly only a variety of that species; it is however easily distinguished by its much smaller leaflets and its smaller, more numerous cymes of rather larger but still very minute flowers.

5. Dalbergia velutina Benth. Pl. Jungh. 255. A long climber with rusty densely pubescent branches. *Leaves* 6–8 in. long, leaflets 13–17, oblong obtuse or subacute membranous, 1·5–2 in. long, ·6–·8 in. wide, dark-green glabrescent to puberulous above, rusty-puberulous to pubescent beneath, stipules large densely pubescent, rachis 5–6 in. long puberulous or pubescent, as are the petiolules ·1 in. long. *Flowers* in somewhat dense axillary panicles, with corymbose branches, 4 in. long 2·5 in. wide, the peduncles branches and pedicels densely pubescent, bracts rather large ovate and bracteoles narrowly lanceolate persistent pubescent; the pair at base of calyx half as long as pedicel one-third as

long as calyx-tube. *Calyx* ·15 in. long, pubescent, campanulate, teeth acute upper shorter than lanceolate lower. *Corolla* white or pink, ·25 in. long, claws of petals as long as calyx-tube. *Stamens* 9 monadelphous. *Pod* thin obtuse brownish, short-stalked, 1-seeded, 2–3 in. long, ·6–·7 in. wide.

Var. *typica;* leaves beneath, leaf-rachis, linear-lanceolate stipules, peduncles and bracts pale rusty-velvety. *D. velutina* Benth. Journ. Linn. Soc. IV, Suppl. 43; Bak. in Flor. Brit. Ind. II, 233. *D. stipulata* Wall. Cat. 5868.

Malacca; *Maingay!* Distrib. Burma, Assam.

Var. *Maingayi* Prain; leaves puberulous glaucescent beneath; leaf-rachis, ovate-acuminate stipules, peduncles and bracts very darkly rusty-puberulous.

Malacca; *Maingay* 612! Singapore; *Ridley!* Distrib. Tenasserim (*Griffith* 1798); Malay Archipelago.

The only pods of true *D. velutina* at Calcutta are still unripe; the description of the fruit is therefore taken from Mr. Baker's account: to Mr. Bentham the fruit was unknown.

Of var. *Maingayi* which, as a note made in Herb. Kew indicates, is at Kew treated as a "less hairy variety" of *D. velutina*, the writer has seen no fruit. Not improbably it may be found ultimately necessary to treat it as a distinct species to be known as *D. Maingayi*.

6. Dalbergia tamarindifolia Roxb. Hort. Beng. 53. A shrubby climber, 15–40 feet high with densely pubescent young branches. *Leaves* 5–6 in. long, leaflets 25–41, thinly pubescent on both surfaces rather paler beneath, crowded, trapezoid-oblong, ·6–·75 in. long, ·3 in. wide, moderately firm, caducous; rachis densely puberulous 4·5–5·5 in. long, petiolules very short; stipules lanceolate densely puberulous ·2 in. long. *Flowers* with the leaves, in congested sessile axillary panicles with corymbose branches ·5–2 in. long, ·5–1 in. wide, peduncles, branches and pedicels densely puberulous, bracts rather large ovate and bracteoles persistent puberulous; pedicels as long as calyx with solitary bracteole as base and two rather large ovate close under calyx, the lower fourth of which they embrace. *Calyx* campanulate, glabrescent (in Malayan specimens), pale greenish-yellow, ·15 in. long, teeth short obtuse. *Corolla* white ·35 in. long, claws of petals as long as calyx-tube. *Stamens* usually 9, rarely 10, monadelphous. *Ovary* glabrous; ovules 2–3. *Pod* thin greenish, drying bright-brown, glabrous, long-stalked, strap-shaped, subacute; 1–3-seeded; not veined nor thickened opposite the seeds, 1·5–3 in. long, ·4–·5 wide. Roxb. Flor. Ind. III, 233 (in part only); Wight, Icones, t. 242 (excluding fig. of fruit); Wall. Cat. 5870; Benth. in Journ. Linn. Soc. IV, Suppl. 44; Miq. Flor. Ind. Bat. I, 131; Bak. in Flor. Brit. Ind. II, 234. *D. rufa* Grah. in Wall. Cat. 5864.

D. multijuga Grah. in Wall. Cat. 5865. *D. livida* Wall Cat. 5866. *D. Blumei* Hassk. Pl. Jav. Rar. 400.

Andamans; very common everywhere in the main group; Barren Island, *Prain!* Langkawi; *Curtis* 2625! Perak; *Scortechini* 68! *Wray* 2387! *Kunstler* 3346! 5963! 6481! 8667! Penang; *Wallich* 5665! Malacca; *Maingay* 602! *Derry* 1167! Distrib. Himalayas from Nepal eastward; Indo-China; Malay Archipelago.

All the Perak and Malacca specimens agree exactly with *D. multijuga* Grah., and that in turn does not differ even as a variety from *D. rufa* Grah., with the type of which Curtis' Langkawi specimens and the Andaman form exactly coincide. These two forms differ from the Upper Burma and Himalayan plant in having fewer-fld., laxer panicles, with a glabrescent instead of a downy calyx. The pods are, however, identical in both. It has been usual to quote Roxburgh without qualification as the authority for this species, in spite of the fact that he has described as belonging to it, the fruit that belongs to *D. Millettii*. And it has been also usual to cite *Derris pinnata* Lour. as this plant, overlooking the fact that *Derris pinnata* has glabrous leaflets and, presumably, only monospermous pods. The writer has not seen Loureiro's original specimens; his description of *D. pinnata*, however, certainly applies more aptly to *D. Millettii* than it does to *D. tamarindifolia*, which moreover does not appear to have such a root as Loureiro describes. In any case until specimens can be produced, *D. pinnata* should be treated as indeterminable.

7. Dalbergia pseudo-sissoo Miq. Flor. Ind. Bat. I, 128. A shrubby climber 15–25 feet long with twining, glabrous branches. *Leaves* glabrous medium-green, 6 in. long, leaflets firm 1–5, oblong slightly narrowed from beyond the middle to the cuneate or rounded base, widely rounded and abruptly cuspidate at apex, 2–4 in. long 1–2 in. wide, rachis 2–3 in., petiolules ·25 in. long. *Flowers* in lax axillary panicles with subcorymbose branches, 2·5–3·5 in. long and almost as broad, the branches finely grey-downy; pedicels ·15 in. long with slender subulate bracteoles under the calyx. *Calyx* campanulate ·2 in. long, externally puberulous, teeth widely triangular obtuse much shorter than the tube. *Corolla* ·35 in. long, petals creamy-white with pink tips their claws as long as the calyx. *Stamens* 9 monadelphous. *Ovary* long-stalked, densely pubescent 1-, or often 2-ovuled, style slender incurved. *Pod* brownish, strap-shaped, obtuse, 3–4 in. long, ·5–·65 in. wide, seed solitary. *D. Championii* Thw. Enum Pl. Zeyl. 95; Benth. in Journ. Linn. Soc. IV, Suppl. 39; Bak. in Flor. Brit. Ind. II, 231. *D. Sissoo* Miq. Flor. Ind. Bat. I, 128 not of Roxb.

Perak; Larut, *Kunstler* 3177! 3340! 3579! 4964! 6565! *Scortechini* 1348! *Wray* 2098! 2965! Penang; Government Hill, *Curtis!* Singapore; Bukit Mandai and elsewhere, *Hullett! Ridley!* Distrib. Ceylon; Malay Islands.

The doubt that has hung over the identity of this species has at length been

cleared up through the kindness of Dr. J. V. Suringar. Both Mr. Bentham and Mr. Baker have suggested that it may be the same as *D. pseudo-sissoo* Miq. and in response to a request made by Dr. King that some Malayan specimens from Calcutta, which are undoubtedly conspecific with the Ceylon plant, might be compared with the Miquelian types at Leiden, Dr. Suringar has not only made the necessary comparisons but has sent to Calcutta examples of some of the authentic specimens and very careful drawings of others. These leave no doubt whatever as to the identity of the two plants named *D. pseudo-sissoo* and *D. Championii*. One curious feature has been noticed in this examination by Dr. Suringar and by the writer. In Ceylon (as Mr. Bentham found) and in Penang the ovaries appear to be always 1-ovuled; in Perak, Singapore and Borneo they are oftener 2-ovuled than 1-ovuled in the proportion of 7 to 3; in Java they are nearly always 2-ovuled, nine ovaries having 2 ovules for one ovary with 1 ovule. A still more interesting discovery made by Dr. Suringar is that *D. Sissoo* Miq. is not *D. Sissoo*. Roxb. (this no one who considers what the native habitat of *D. Sissoo* is, will be surprised to learn), but that it is (what was hardly to be expected) Dr. Miquel's own *D. pseudo-sissoo*. Dr. Suringar, in confirmation of his discovery, has sent to Calcutta an authentic specimen of *D. Sissoo* Miq. in Herb. Leiden (not of Roxb.). This then explains the "unfortunate selection" of name that Mr. Bentham very justly comments upon. Dr. Suringar, sharing Mr. Bentham's feeling, suggests that in view of this extraordinary confusion it would be better to drop Miquel's name altogether; and the writer would very gladly have adopted the suggestion and continued to use Dr. Thwaites' name *D. Championii*, had the dictates of common-sense been of any weight in modern nomenclature. But unfortunately there is now no doubt that the plant named *D. pseudo-sissoo* by Miquel is the same as that named *D. Championii* by Thwaites; it cannot be gainsaid that so far as it goes, the description of *D. pseudo-sissoo* applies to the species; and it is clear that the name *D. pseudo-sissoo* has nine years' priority over the name *D. Championii*. This being so, Miquel's name may just as well be given precedence now, seeing that one or other of the bibliographers who pose as botanists would make the alteration so soon as this note appears, in spite of the fact that Miquel did not recognise his own species when he saw it.

8. Dalbergia Hullettii Prain. A small tree with blackish rugose rusty-puberulous thickish branchlets, without leaves at time of flowering. *Flowers* in short, clustered racemes, 1–1·5 in. long, springing from tufts of triangular rusty-pubescent small bracts in axils of old leaves; lowest pedicels longer than the rest, slender, ·3 in. long, rusty-pubescent as are the peduncles; bracteoles at base of pedicels solitary ovate-lanceolate ·1 in. long persistent, the pair below calyx subulate very small. *Calyx* campanulate, densely rusty-tomentose ·15 in. long, teeth half as long as tube, acute. *Corolla* ·3 in. long, claws of petals as long as calyx-tube. *Stamens* 9, rarely 10, monadelphous. *Ovary* with densely pubescent stalk; ovule solitary. *Pod* unknown.

Singapore; *Hullett* 626!

A very distinct species, only once reported. It is nearest to a Bornean tree apparently as yet undescribed (*Haviland* n. 2894); the only difference between the flowers of the two is that in the Bornean plant the ovary is densely woolly; in this the ovary is quite glabrous though its stalk is pubescent. The Bornean plant has

leaves with solitary or trifoliolate leaflets; when trifoliolate the lateral leaflets are subopposite. It thus approaches most nearly to *D. pseudo-sissoo* which also has flowers similar to those of *D. Hullettii* and of Haviland's species from Borneo.

§ 3. SELENOLOBIUM. *Pod* thickened throughout upper suture, recurved at least while young.

9. DALBERGIA TORTA Grah. in Wall. Cat. 5873. An unarmed littoral climber with twining glabrescent branches often twisted into spiral hooks. *Leaves* 3 in. long, leaflets 5 (very rarely 7 or 3), obovate-oblong obtuse sometimes emarginate, dark-green and glabrous above paler and sparingly adpressed-puberulous beneath, ·6–·8 in. long, ·4–·6 in. wide; rachis 2 in. long glabrous as are the petiolules ·1 in. long. *Flowers* in sessile congested axillary panicles, 1–2 in. long, with very slightly puberulous branches, bracts small ovate-lanceolate persistent; pedicels very short with a small ovate-lanceolate bracteole at the base and with two larger ovate bracteoles under the calyx embracing lower third of its tube. *Calyx* glabrescent, wide-campanulate, ·15 in. long, teeth short, wide-triangular, obtuse. *Corolla* white, ·25 in. long, claws of petals as long as calyx-tube. *Stamens* 10 monadelphous. *Pod* brown flat glabrous, ·9 in. long, ·5 in. wide, upper suture recurved, rather thick-walled throughout, 1-seeded; stalk as long as calyx. *D. monosperma* Dalz. in Hook. Journ. Bot. II, 36; Benth. in Journ. Linn. Soc. IV, Suppl. 48; Miq. Flor. Ind. Bat. I, 132; Bak. in Flor. Brit. Ind. II, 237.

ANDAMANS: very common on all the coasts of the main group; Narcondam, *Prain!* PENANG; *Wallich* 5873! *Curtis* 220! LANGKAWI; *Curtis* 2868! PERAK; coast at Matong, *Scortechini* 1099! *Wray* 2502! MALACCA; at Tanjong Kling, *Ridley* 3312! SINGAPORE; growing in salt water, *Kunstler* 66! Krangi, *Ridley* 5576! *T. Anderson! Kurz!* DISTRIB. Western coasts of India; Sundribuns; Burma; Borneo; New Guinea; China.

A purely littoral species. The citation of *Wall. Cat.* 5879 by Dr. Miquel and Mr. Baker for this species is due to their having copied the statement from Mr. Bentham. By an uncorrected printer's error Mr. Bentham is made in the description to quote this number, though in the notice of localities the number 5873 is correctly given.

10. DALBERGIA MENOEIDES Prain. An unarmed climber with glabrous, twining, hooked branches. *Leaves* 5 in. long, leaflets 3, ovate lanceolate tapering to both ends, dark-green and glabrous above, paler and sparsely adpressed-puberulous beneath, 3–3·5 in. long, 1–1·5 in. wide; rachis 1·5 in. long, glabrous, petiolules ·08 in. puberulous. *Flowers* very few, sessile, clustered at tips of short puberulous axillary peduncles ·15–·25 in. long, each with two ovate bracteoles embracing lower fourth of calyx-tube. *Calyx* campanulate, externally sparingly

puberulous ·15 in. long, teeth short subequal obtuse. *Corolla* ·35 in. long, claws of petals as long as calyx-tube. *Stamens* 10 monadelphous. *Ovary* glabrous, ovule solitary. *Pod* greenish, semilunar, flat, glabrous, firm, reticulated throughout, upper suture recurved, 1·5 in. long, ·75 in. wide; 1-seeded; tip acute, stalk rather longer than calyx.

PERAK; Krian, *Scortechini* 1392!

A very distinct species with leaflets somewhat resembling those of *D. pseudo-sissoo.*

11. DALBERGIA KUNSTLERI Prain. An extensive climber 40–150 feet long with stem 3–6 in. in diam. and pubescent young branches. *Leaves* 10–12 in. long, leaflets 7–9, the lateral ones subopposed, dark-green quite glabrous above, dark-grey when young densely pubescent when old sparsely puberulous beneath, rigidly coriaceous, elliptic-acuminate, 4–6 in. long, 2 in. wide, with very prominent midrib and 8–9 pairs of spreading lateral veins beneath, secondary venation also distinct, rachis 8 in. long, petiolules ·3 in. long at first densely pubescent ultimately glabrescent. *Flowers* in axillary panicles 4–6 in. long with spreading rusty-puberulous branches, bracts and bracteoles deciduous, pedicels under ·1 in. *Calyx* ·15 in., teeth lanceolate except the upper, the lowest twice as long as the tube. *Corolla* dark-blue, ·35 in. long, standard orbicular emarginate. *Stamens* monadelphous. *Ovary* pubescent. *Pod* finely puberulous, rigid, much thickened throughout, 1–2-seeded, 1·5–2·5 in. long, ·9 in. wide, ·3 in. thick, short-stalked, dark-brown to almost black when ripe, with grey lines alongside the sutures.

PERAK; Goping, *Kunstler* 4736! Kinta, *Kunstler* 7067!

A very fine species nearest to *D. reniformis*; it differs in being a climber whereas that species is a tree; in having blue flowers whereas that species has them white; in having larger and thicker leaves and larger pods. The pod is quite indehiscent but as the seed matures the epicarp cracks alongside both sutures so that, when quite ripe, the pod, as Kunstler remarks in a field note, shows a "grey seam" due to the exposure of the mesocarp along two lines parallel to each suture. Sometimes the pod consists of but one reniform segment with a solitary seed; usually however there are two segments though the seed inside the distal segment rarely developes; when this happens the epicarp does not give way, and there is then no "grey seam" along the suture.

12. DALBERGIA PARVIFLORA Roxb. Hort. Beng. 98. A strong climber 30–80 feet long with glabrous branches. *Leaves* 6–8 in. long, leaflets 5–9, ovate-lanceolate with obtuse slightly emarginate tips, light-green quite glabrous on both surfaces, finely reticulately veined beneath, 2–3·5 in. long ·75–1·5 in. wide; rachis 2–3 in. and petiolules ·15 in. long, glabrous. *Flowers* very small in axillary and terminal panicles of congested dichotomous cymes with puberulous branches; bracts rounded ciliate deciduous; bracteoles at base of very short pedicels rounded persistent,

the pair at base of calyx oblong ciliate embracing lower half of tube. *Calyx* ·08 in., campanulate, teeth obtuse upper two connate, lower three subequal all as long as tube. *Corolla* white, ·15 in. long, claws of petals short. *Stamens* 10, monadelphous. *Ovary* glabrous. *Pod* turgid 1–3-seeded; ·75–2 in. long, ·6 in. wide, when young falcate along upper, when ripe convex along both sutures, when 2- or 3-seeded torulose between the seeds. Flor. Ind. III, 225; Miq. Flor. Ind. Bat. I, 132; Benth. Journ. Linn. Soc. IV, Suppl. 33. *D. Cumingiana* Benth. Pl. Jungh. 255; Journ. Linn. Soc. IV, Suppl. 32; Miq. Flor. Ind. Bat. I, 129. *D. Zollingeriana* Miq. Flor. Ind. Bat. I, 130. *Drepanocarpus Cumingii* Kurz, Journ. As. Soc. Beng. XLV, pt. 2. 282.

Andamans; *Helfer* 1808! Dindings; *Curtis!* Pahang; *Ridley* 1374! 2639! Perak; Matang Jambu, *Wray* 2525! Goping, *Kunstler* 1423! 5973! 6151! *Scortechini*! Distrib. Malay Archipelago.

Regarding this plant Mr. Hemsley has noted:—"This agrees with Kew speci-"mens of *D. reniformis* Roxb." This species, however, is a climber whereas *D. reniformis* is a tree; Roxburgh's *D. reniformis* has moreover much larger flowers and, as in *D. Kunstleri*, the fruits of *D. reniformis* remain falcate along the upper suture even when ripe.

That this is *D. parviflora* Roxb. hardly admits of a doubt. Mr. Bentham and Mr. Baker have, indeed, suggested that *D. parviflora* may be the same as *D. Junghuhnii*; in spite of the very great authority of these authors this suggestion must be abandoned as untenable. The number and, still more, shape of the leaflets make the identification impossible; moreover, Roxburgh's account of the pod shows that his species *must* be, as Miquel admits, a *Selenolobium* and not as Bentham and Baker suppose, a *Sissoa*. Roxburgh's description is meagre in the extreme; but since *D. Cumingiana* provides a species that exhibits *all* the characters of *D. parviflora* and as no other Malayan species of *Dalbergia* hitherto found does so, it seems imperative to use Roxburgh's name for the species.

A more interesting question regarding this plant is, however, its supposed identity with Rumphius' *Lacca lignum* (*Herb. Amboin.* V, 17. t. 13). So far as Calcutta specimens go the only authority for the belief is the existence of a specimen from Halmaheira (*Teysmann* n. 5668) on which Mr. Teysmann has written "Kayoe lakka" and another from Tarabangie, Lampongs, Sumatra (*Hort. Bogor* n. 4440) also collected by Mr. Teysmann and also marked "Kayoe lakka." It is remarkable that our other Sumatra specimens, collected on the R. Rawas by Dr. H. O. Forbes (*Forbes* n. 3216), have no note to this effect, and just as remarkable that collectors so careful as Mr. Ridley, Fr. Scortechini, Herr Kunstler and Mr. Wray, who have sent us numerous specimens of the same species, should have made no note regarding it. Their silence renders the matter doubtful, and appears to afford good ground for Dr. Kuntze's refusal (*Rev. Gen. Plant.* I, 158) to accept the identification proposed by Teysmann and adopted by Hasskarl (*Neue Schluessel zu Rumph.* p. 90). As Kuntze justly remarks, the meagre account of the flower given by Rumphius does not fit the present species since Ramphius says it has two petals, and though the general habit agrees that alone hardly suffices for identification. The calyx of the only open flower in the figure quite accords with the calyx

of our plant and the fruit also quite agrees. But the uppermost branchlets are shown as curved and twisted like those of *D. torta* while those lower down are figured as passing into spines like those of *D. spinosa*, two species that, though they belong to the same section of *Dalbergia*, are nevertheless very different from *D. parviflora*. None of our very numerous specimens show either hooks or spines, nor have any of the field-notes that accompany the specimens a reference to spines on the stem.

In the Herbarium of the Penang Forest Department, kindly lent by Mr. Curtis, there is however a specimen from Lumot in the Dindings, to which the native name "Kayu Laha" is attached along with the further note, "climber; wood valuable, used as incense." This specimen, from a widely remote locality, thus bears a note made without reference to the controversy that has arisen regarding *Kayoe lakka* but that entirely confirms the notes of Mr. Teysmann, who was, it may be remarked, one of the most careful collectors that has ever worked in Malaya. The existence of this specimen therefore re-opens the whole question, which may be commended to Malayan field-botanists as one worthy of attention and solution. To judge from Rumphius' account there were, in his time, three if not four species included under the name *Caju Lacca* and of one, at least, of these he says that it had *no* spines, only thickened nodes instead. It seems quite certain that *D. parviflora* must have been one of the four. But whether his figure is meant to represent it or has been made to include some of the characters of the others as well, can only be known when all four are completely understood.

31. Pterocarpus Linn.

Erect trees. *Leaves* with alternate coriaceous exstipellate leaflets. *Flowers* yellowish, in copious panicled racemes; bracts and bracteoles minute, caducous; pedicels distinctly articulated at the apex. *Calyx* turbinate, curved before expansion, the teeth short. *Petals* exserted, with long claws; standard and wings crisped; keel obtuse, the petals scarcely or not at all coherent. *Staminal* sheath slit both above and below, or above only; the upper stamen often nearly or quite free; anthers versatile. *Ovary* stalked, 2-ovuled; style incurved, stigma terminal. *Pod* orbicular, rarely other than 1-seeded, with a broad rigid wing, the point turned down to opposite the base or near it. Species about 15; cosmopolitan in the Tropics.

Leaflets finely veined throughout, pedicels slender longer than the calyx, beak of pod distinctly raised beyond the outer base ... ... 1. *P. indicus.*

Leaflets with 5–7 pairs of distinctly raised veins beneath, pedicels stoutish shorter than the calyx, beak of pod hardly raised beyond the outer base ... ... 2. *P. dalbergioides.*

1. Pterocarpus indicus Willd. Sp. Pl. III, 904. A tree 30–40 feet high with widely spreading branches drooping at the end. *Leaves* 8–10 in. long, leaflets 5–9 moderately firm, 2–4 in. long 1·5–2 in. wide, the terminal rather larger than the others, the rachis usually faintly prolonged, all ovate with rounded rarely deltoid base and rounded

abruptly acuminate apex, glabrous on both surfaces, dark-green, margins entire but distinctly undulate, uniformly finely veined throughout, stipules lanceolate ·5 in. long early caducous, petiolules ·25 in., glabrous as is the leaf-rachis. *Flowers* in copious terminal and axillary panicles, rachis and pedicels glabrescent, pedicels ·3 in. long, very slender, with 2 linear caducous bracteoles ·1 in. long, half as long as bud, at apex. *Calyx* ·25 in. long, finely brown-silky, teeth rounded the two uppermost exceeding the others. *Corolla* yellow, ·6 in. long, standard ·5 in. across. *Pod* orbicular, with stalk ·3 in. long, 1·75–2·25 in. in diameter, uniformly sparsely adpressed-pubescent with silky hairs, rather distinctly anastomotically 2–3-veined opposite the seed, the style usually a considerable distance (65°–100°) above the base, pointing outwards at right angles to the stalk. Roxb. Hort. Beng. 53; DC. Prodr. II, 419; Roxb. Flor. Ind. III, 238; Benth. in Journ. Linn. Soc. IV, Suppl. 77 (in part only); Miq. Flor. Ind. Bat. I, 135; Bak. in Flor. Brit. Ind. II, 238 (in part only). *P. Draco* Lamk. Ill. t. 602, f. 2, *b* (not *a*). *P. dalbergioides* Wall. Cat. 5343 (letter G only) not of Roxb. *P. Zollingeri* Miq. Flor. Ind. Bat. I, 136. *P. obtusatus* Miq. Flor. Ind. Bat. I, 136. *P. saxatilis* Bl. MSS. in Hort. Bogor. *Lingoum saxatile* Rumph. Herb. Amboin. II, t. 70.

Penang; *Wallich* 5843 G! Malacca; *Griffith! Maingay* 550! Perak; *Kunstler* 1513! 8713! *Scortechini* 503! *Wray* 2003! 2280! Distrib. Northwards throughout Tenasserim to Martaban; southwards to Sumatra and Java.

A fine tree often confused with the next species from which it is, however, very distinct in foliage and somewhat different in habit.

2. Pterocarpus dalbergioides Roxb. Hort. Beng. 53. A tree 60–80 feet high with ascending branches, spreading at the end. *Leaves* 8–10 in. long, leaflets 5–9, firm, 2–4 in. long 1–1·5 in. wide the terminal rather larger than the others, ovate-lanceolate with deltoid rarely rounded base and gradually narrowing to apex, glabrous on both surfaces, pale-green, margins entire hardly undulate, with 5–7 pairs of distinctly raised veins beneath, stipules lanceolate ·5 in. long, early caducous, petiolules ·15 in. long glabrous as is the leaf-rachis. *Flowers* in copious terminal and axillary panicles, rachis and pedicels finely brown-pubescent, pedicels ·2 in. long stoutish with 2 very shortly ovate caducous bracteoles under ·05 in. long, less than $\frac{1}{5}$ as long as bud, at apex. *Calyx* ·25 in. long, densely brown silky, teeth rounded the two uppermost exceeding the others. *Corolla* yellow ·4 in. long, standard ·35 in. across. *Pod* orbicular, with stalk ·6 in. long, 2–2·25 in. in diameter, uniformly very finely puberulous and not veined opposite the seed, the style usually a short distance (40°–50°) above the base, pointing slightly downwards. DC. Prodr. II, 418: Roxb. Flor. Ind. III, 236; W. & A. Prodr. 267

Wall. Cat. 5843 (excluding G and, according to W. & A., also excluding D). *P. indicus* Benth. in Journ. Linn. Soc. IV, Suppl. 77, in part; Bedd. Fl. Sylvat. t. 23; Bak. in Flor. Brit. Ind. II, 238 in part, not of Willd.

ANDAMANS; common.

This tree is usually treated as a form of the preceding species, and it has been the fashion to say that the two are not distinguishable by 'botanical' characters. As they grow it would be very hard to mistake them, and when have been carefully examined it becomes difficult to realize that, even in the herbarium, they should ever have been confounded.

32. ARACHIS Linn.

Annual herbs. *Leaves* abruptly pinnate, leaflets few; stipules elongated adnate to the petiole. *Calyx* long-tubular simulating a pedicel, 2-lipped; the upper lip 4-toothed the lower long slender. *Corolla* resupinate. *Stamens* (sometimes only 9) united in a tube inserted with the petals on calyx limb; staminal tube grooved on vexillary side but not split; anthers dimorphic alternately on short filaments versatile and on longer subbasifixed. *Ovary* at first short-stalked, at base of calyx-tube, the stalk soon elongating; style filiform, bearded above; stigma minute. *Pod* long-stalked ovate-oblong, obtuse at both ends, gibbous, torulose, reticulated, coriaceous, indehiscent, 2–4-seeded. *Seeds* fleshy, oily. Species 7; six in Brazil, 1 widely cultivated in the tropics.

ARACHIS HYPOGÆA Linn. Sp. Pl. 741. An annual diffuse herb, stems grooved and angled 6–20 in. high, often much branched near base; stems and branches clothed with longish spreading hairs. *Leaf-rachis* pubescent 2–4 in. long; leaflets exstipellate in 2 opposite pairs, ovate-oblong obtuse with rounded base, 1–1·5 in. long, ·6–1 in. wide, green and glabrous above, pale and sparsely clothed with spreading hairs beneath; stipules narrow lanceolate 1 in. long, ·15 in. wide, upper half free. *Flowers* 2–7, in leaf-axils along the stem. *Calyx*-lips ·25 in. long, the lower linear the upper ·15 in. wide. *Corolla* ·4 in. long, pale-yellow or white; standard suborbicular, glabrous, keel beaked. *Pod* carried underground by the elongating pedicel, where it ripens; 1–1·25 in. long, ·5 in. across; 2–3-seeded. DC. Prodr. II, 474; Miq. Flor. Ind. Bat. I, 218.

SINGAPORE; cultivated, *Anderson!* PENANG; cultivated, *Curtis!*

The "Ground-Nut," commonly cultivated in India and Malaya, probably originally introduced into the old world from Brazil.

33. ZORNIA Gmel.

Annuals, with large geminate coriaceous bracts and dotted leaflets in 1–2 opposite pairs. *Flowers* in lax racemes. *Calyx* minute; upper

teeth short, connate; lowest shorter than the two middle ones. *Corolla* much exserted; standard broad; keel incurved, acute. *Stamens* monadelphous; anthers dimorphous. *Ovary* sessile, many-ovuled; style filiform, incurved, stigma minute capitate. *Pod* of several small round flattened finely muricated 1-seeded indehiscent joints. Species 10, all but two American.

Zornia diphylla Pers. Synops. II, 318. A diffuse annual with slender zigzag wiry branches reaching 11–15 in. in length, glabrous or sparingly puberulous. *Leaf-rachis* ·25 in. long, puberulous, channelled above; leaflets in one terminal pair, oblong or lanceolate (lanceolate in Malayan specimens), ·5 in. long, ·12 in. wide, glabrous, conspicuously dotted; stipules lanceolate with a long spur. *Racemes* laxly 3–12-fld., 1–3 in. long; bracts also dotted, ovate-acute, almost concealing flowers and fruits. *Calyx* minute. *Corolla* slightly exserted. *Pods* 1–6-jointed; joints ·08 in. long, pubescent, and irregularly sprinkled with harsh prickles. Benth. in Mart. Flor. Bras. XV, 80, t, 21, 22; Bak. in Flor. Brit. Ind. II, 147. *Zornia angustifolia* Smith in Rees Cyclop. n. 1; DC. Prodr. II, 316; Wall. Cat. 5660; Miq. Flor. Ind. Bat. I, 278. *Z. dictyocarpa* DC. Prodr. II, 327. *Z. gibbosa* Span. Linnæa XV, 191. *Z. graminea* Span. Linnæa XV, 192. *Hedysarum diphyllum* Linn. Sp. Pl. 747; Roxb. Flor. Ind. III, 353.

Singapore; Changi, *Ridley* 4672! Distrib. Cosmopolitan in the tropics.

34. Smithia Ait.

Herbs or undershrubs. *Leaflets* many small sensitive, opposite, leaf-rachis ending in a bristle; stipules scariose with large auricles. *Flowers* racemose or axillary. *Calyx* deeply 2-lipped, the lips usually entire. *Corolla* exserted; standard orbicular; keel incurved obtuse. *Stamens* in two bundles of 5 each; anthers uniform. *Ovary* linear, many-ovuled; style incurved, filiform, stigma minute capitate. *Pod* of many or few small flattened or turgid joints, folded together inside the calyx. Species 20–30, throughout tropics of the Eastern Hemisphere.

Smithia sensitiva Ait. Hort. Kew. ed. I, III, 496. A diffuse spreading annual with slender glabrous much branched stems 1–3 feet long, only ·12 in. thick at base. *Leaf-rachis* ·5–1 in. long sparsely beset with long whitish bristles; leaflets 3–10 pairs, ·25–·4 in. long, oblong obtuse, sparsely bristly on the almost straight margins and on the midrib beneath. *Racemes* simple 1–6-fld., in axils of upper leaves on peduncles ·3 in. long, pedicels slender bracteolate ·15 in. long or less, ascending; bracteoles small ovate-acute scarious. *Calyx* ·25–·3 in. long, lips subequal, entire, acute, with a few scattered subadpressed pale-yellow

bristles. *Corolla* yellow, glabrous, ·4 in. long. *Pod* 4–6-jointed; faces densely papillose. DC. Prodr. II, 325; Roxb. Hort. Beng, 56; Flor. Ind. III, 342; Salisb. Paradis. t. 92; Miq. Flor. Ind. Bat. 1, 272; Bak. in Flor. Brit. Ind. 148. *S. abyssinica* Hochst. in. Schimp. Pl. Abyssin.

Andamans; a common weed throughout the settlement at Port Blair. Nicobars; Kamorta, *Kurz!* Distrib. Africa; S.-E. Asia.

Not seen from the other provinces; probably a recent introduction from India. From Java comes a very closely allied plant (*S. javanica* Miq.) which differs mainly in having no bristles on the calyx; this may be no more than a form of the Indian and African *S. sensitiva*: all the specimens reported are, however, very uniform.

35. Ormocarpum Beauv.

Shrubs. *Leaves* with odd-pinnate exstipellate leaflets and persistent striated stipules and bracts. *Flowers* in lax racemes. *Calyx*-tube campanulate; 2 upper teeth deltoid; 3 lower lanceolate. *Standard* broad; keel much incurved, not at all beaked. *Stamens* in two bundles of 5 each; anthers uniform. *Ovary* linear, few-ovuled; style filiform, inflexed, stigma minute terminal. *Pod* of a few indehiscent turgid linear or oblong joints, the lower seedless, the faces rugose, naked or muricated with weak gland-tipped prikles. Species 6, spread all round the world in the tropics.

Ormocarpum glabrum Teysm. & Binnend. Nat. Tijd. Ned. Ind. XXVII, 56. A small tree 12–14 feet high, with smooth angular branches; epidermis desquamating. *Leaves* 6 in. long, leaflets 1 in. long, ·4 in. wide, terminal and 8–9 alternate lateral elliptic obtuse mucronate, glabrous, glaucescent beneath; rachis subtrigonous, glabrous, thickened at base; stipules subulate erect. *Racemes* corymbose, on short peduncles ·12 in. long; individual flowers on slender pedicels ·5 in. long, 2-bracteolate above the middle. *Calyx* ·25 in. long, green, campanulate, unequally 5-toothed, glabrous externally; teeth oblong, acute. *Corolla* much exserted, yellow, purple-veined; standard suborbicular retuse. *Ovary* long-stipitate, glabrous. *Pod* 6–7-jointed, ultimately becoming blackish, 5–6 in. long; individual joints ·75–1 in. long, externally marked with 6–8 longitudinal more or less parallel ridges.

Andamans; very common in thickets near Port Blair; no doubt introduced. Distrib. Malay Archipelago.

This has the general habit of the common Indian *O. sennoides*, of which it is perhaps only a cultivated form; its pods, however, are much longer and are never muricated. The original description, it should be noted, was made from specimens cultivated at Buitenzorg.

36. Æschynomene Linn.

Erect herbs or undershrubs. *Leaves* with very numerous close

sensitive odd-pinnate small linear leaflets. *Flowers* in sparse racemes. *Calyx* deeply 2-lipped, the lips faintly toothed. *Corolla* fugacious; standard orbicular; keel not beaked. *Stamens* in two bundles of 5 each; anthers uniform. *Ovary* stalked, linear, many-ovuled; style filiform, incurved, stigma terminal. *Pod* linear, with a stalk longer than the calyx, and 4–8 flattened 1-seeded separating joints. Species about 30, spread everywhere in the tropics.

Stems woody, slender, much-branched; calyx and corolla small glabrous; pods narrow, smooth ... ... 1. *Æ. indica.*
Stems pith-like, stout, little-branched; calyx and large corolla hispid; pods broad, warted ... ... 2. *Æ. aspera.*

1. Æschynomene indica Linn. Sp. Pl. 713. A slender, much branched annual undershrub, stems 1–3 feet high under ·15 in. in diam. at base; everywhere glabrous, pale-green; branches slender twiggy terete. *Leaf-rachis* 2–3 in. long; leaflets close, terminal and in 20–30 opposite pairs, linear, obtuse, 1-nerved, ·2 in. long; stipules lanceolate, ·3 in. long, membranous, deciduous, with a large auricle. *Racemes* axillary 1–4-fld.; peduncles 1 in. and pedicels ·3 in., usually viscid; bracteoles small subulate glandular. *Calyx* ·2 in., glabrous, teeth unequal the two upper subconnate, persistent, withering. *Corolla* pale-yellow, tinged with pink or orange, ·45 in. long, glabrous, fugacious, standard orbicular emarginate. *Stigma* capitate. *Pod* 1–1·5 in. long, straight or at times slightly curved, upper suture even, lower indented between the 8–10 separating smooth or faintly papillose joints ·12–·15 in. broad. DC. Prodr. II, 320; Miq. Flor. Ind. Bat. I, 274; Bak. in Flor. Brit. Ind. II, 151. *Æ. pumila* Linn. Sp. Pl. ed. II, 1061; DC. Prodr. II, 321. *Æ. aspera* Wall. Cat. 5666 not of Linn. *Æ. diffusa* Willd. Sp. Pl. III, 1164; DC. Prodr. II. 321; Wall. Cat. 5565. *Æ. viscidula* Willd. Enum. 776. *Æ. Roxburghii* Spreng. Syst. III, 322. *Smithia aspera* Roxb. Hort. Beng. 56; Flor. Ind. III, 343. *Hedysarum Neli-Tali* Roxb. Hort. Beng. 57; Flor. Ind. III, 365.

Andamans; Port Mouat, plentiful. Prov. Wellesley; *Ridley* 8009! Distrib. Tropics generally.

2. Æschynomene aspera Linn. Sp. Pl. 713. A tall erect swamp-shrub reaching 10–12 feet in height, stems 3 in. or more in diam., externally glabrous, internally full of soft white pith; branches few or none. *Leaf-rachis* 3–6 in. long; leaflets terminal and in 30–50 opposite pairs, linear, obtuse, 1-nerved, ·5 in. long; stipules lanceolate ·5 in. long, auricled, deciduous. *Racemes* axillary corymbosely 2–4-fld.; peduncles 1 in. and pedicels ·4 in. clothed with spreading bristles; bracteoles small ovate deciduous. *Calyx* ·4 in., hispidly hairy, unequally 5-toothed, the two upper teeth subconnate. *Corolla* ·75 in. yellow, fugacious, standard orbicular. *Pod* 2–2·5 in. long, ·3 in. across, often indented on

both the echinulate sutures, always along the lower, between the 4–8 separating joints which are usually echinulate on the face, rarely smooth. DC. Prodr. II, 320; Miq. Flor. Ind. Bat. I, 275; Bak. in Flor. Brit. Ind. II, 152. *Æ. indica* Wall. Cat. 5667 not of Linn. *Æ. trachyloba* Miq. Flor. Ind. Bat. I, 276. *Æ. indica* VAR. *aspera* Hassk. Pl. Jav. Rar. 340. *Hedysarum lagenarium* Roxb. Hort. Beng. 57; Flor. Ind. III, 365.

MALACCA; *Griffith!* DISTRIB. Tropical S.-E. Asia and Tropical Africa.

This is the well-known "Sola" plant, the pith of which is used in making sun-hats, fishermen's floats and other articles where great lightness is desirable. Doubtless it is an introduced plant in Malacca.

37. PHYLACIUM Benn.

Climbing herbs. *Leaves* 3-foliolate; stipules persistent small linear or lanceolate, leaflets stipellate. *Flowers* in axillary racemes shortly pedicelled, 2-bracteolate near the calyx, completely enveloped, as ultimately is the legume, in a large boat-shaped membranous accrescent bract. *Calyx* tubular, sub-2-labiate, 4-toothed. *Standard* ovate, apex retuse base 2-auriculate; wings oblong, long-spurred, spurs incurved clasped by the auricles of the standard; keel straight obtuse shortly spurred. *Stamens* diadelphous, posterior filament adnate to base of standard-claw. *Ovary* short-stalked, its base surrounded by a shallow disc; ovule solitary; style inflexed. *Pod* short-stalked ovate-rotund, acute. Species 2, the present and another which is Indo-Chinese.

PHYLACIUM BRACTEOSUM Benn. Pl. Jav. Rar. 159 t. 33. A slender climber 20–30 feet long, young parts and leaves beneath sparingly adpressed-hirsute. *Leaves* pinnately 3-foliolate; leaflets ovate-oblong base rounded apex obtuse, thinly herbaceous, green on both surfaces, glabrous above, sparingly hirsute beneath, 2–3 in. long, 1·5 in. wide; petioles glabrescent 1·5 in. long, stipules and stipels linear, persistent. *Racemes* axillary 2–10 together, 1·5–2 in. long, shorter than the leaves, flowers fasciculate few. *Bracts* pale-green, 1–1·5 in. long, externally glabrous, sparing hirsute within. *Calyx* ·15 in. long, externally sparingly hirsute, upper lip entire ovate, lower 3-lobed, lobes lanceolate the central rather the larger, none overlapping. *Corolla* ·3 in. long, white with a pink tinge, glabrous. *Pod* ·25 in. long, compressed, sparing hirsute, reticulate. Benth. Pl. Jungh. I, 231; Miq. Flor. Ind. Bat. I, 228.

PERAK; near Gunong Pondo, in open jungle, 200–300 feet elev., *Kunstler* 8367! DISTRIB. Sumatra and Java to the Philippines.

38. URARIA Desv.

Suffruticose perennials. *Leaves* stipellate, with 1 to 9 leaflets. *Flowers* very numerous, minute, racemose. *Calyx*-tube very short; two

upper teeth short; three lower usually elongated, setaceous. *Standard* broad; wings adhering to the obtuse keel. *Stamens* diadelphous; anthers uniform. *Ovary* sessile or short-stalked, few-ovuled; style inflexed filiform, stigma terminal. *Pod* of 2–6 small turgid 1-seeded indehiscent joints, often placed face to face. Species 15, S.-E. Asiatic.

Stems erect, heads long cylindric; upper leaves 5–9-foliolate, leaflets much longer than broad:—

Leaflets narrowly lanceolate, clouded above, pedicels clothed with short bristles, joints of pod polished glabrous ... 1. *U. picta.*

Leaflets oblong, green above, pedicels clothed with long bristles, joints of pod dull puberulous ... .. 2. *U. crinita.*

Stems trailing heads short oblong; leaves 1-foliolate and 3-foliolate intermixed, leaflets not much longer than broad ... 3. *U. lagopoides.*

1. Uraria picta Desv. Journ. Bot. I, 123 t. 5 f. 19. An erect little-branched suffruticose perennial 3–6 feet high, with stout finely downy stems ·5 in. or more in diam. at base. *Leaves* 10–12 in. long, rachis finely downy; leaflets terminal and in 2–4 opposite pairs, linear-lanceolate, rigidly subcoriaceous, glabrous clouded with white above, finely reticulate veined and minutely pubescent beneath, 4–8 in. long ·3–·6 in. wide; petiole 2–2·5 in. long, stipules lanceolate long-acuminate from a broad base ·5 in. long with parallel veins, stipels subulate ·2 in. long; the lowest leaves simple or 3-foliolate, round or oblong. *Racemes* in dense cylindric heads 6–12 in. long, ·65–·75 in. broad; bracts brown scariose deciduous, upper lanceolate lower ovate-acuminate; pedicels ·25–·35 in. long, covered with short bristles, abruptly incurved at the tip after flowering. *Calyx* ·2 in. long. *Corolla* purple, exserted, ·3 in. long *Pod* glabrous, pale lead-coloured, joints 3–6, smooth polished, ·13 in. long ·1 in. wide, compressed. DC. Prodr. II, 324; Wall. Cat. 5674; Miq. Flor. Ind. Bat. I, 267; Bak. in Flor. Brit. Ind. II, 155. *U. linearis* Hassk. Pl. Jav. Rar. 349. *Hedysarum pictum* Jacq. Ic. t. 567; Roxb. Hort. Beng. 57. *Doodia picta* Roxb. Flor. Ind. III, 368.

Perak; *Scortechini!* Prov. Wellesley; *Ridley* 6958! Nicobars; Kamorta, *Kurz!* Distrib. India; Indo-China; Malay Islands.

2. Uraria crinita Desv. Journ. Bot. I, 123. An erect little-branched perennial 3–8 feet high, with stout finely downy stems ·75 in. or more in diam. at base. *Leaves* 8–15 in. long, rachis sparingly puberulous, leaflets terminal and in 2–3 opposite pairs, ovate-oblong acute, subcoriaceous, glabrous, green above, finely reticulate-veined and minutely tomentose beneath, 3–4 in. long, 1–1·5 in. wide, base rounded; petiole 3–4 in. long, stipules lanceolate acuminate ·6 in. long, puberulous; stipels lanceolate ·15 in. long; the lowest leaves simple or trifoliolate, ovate or subcordate. *Racemes* in dense cylindric heads 8–18 in. long, 1–1·5 in. broad; bracts scariose deciduous ovate-acuminate, ciliate;

pedicels 45–·65 in. long, covered with long spreading bristles, abruptly incurved at the tip after flowering. *Calyx* ·2 in. long, teeth sparingly plumose. *Corolla* pale-purple, ·3 in. long. *Pod* puberulous, joints 4–6, black, dull, ·13 in. long, ·1 in. wide, compressed. DC. Prodr. II, 324; Wall. Cat. 5675; Miq. Flor. Ind. Bat. I, 268; Bak. in Flor. Brit. Ind. II, 155. *U. comosa* DC. Prodr. II, 324. *U. picta* Wight, Ic t. 411, not of Desv. *Hedysarum crinitum* Linn. Mant. I, 102; Burm. Flor. Ind. 169 t. 56; Roxb. Hort. Beng. 57. *Doodia crinita* Roxb. Flor. Ind. III, 369.

Pahang; Renchong, etc. *Ridley!* Perak; Thaipeng, *Scortechini* 71! Sunga Ryah, *Kunstler* 1011! Malacca; *Maingay* 527! Singapore; *Hullett* 49! *Ridley* 8110! Distrib. India, Indo-China, China, Malay Islands.

3. Uraria lagopoides DC. Prodr. II, 324. A tufted woody perennial with slender trailing pubescent much branched stems 1–3 feet long. *Leaves* 1·5–2 in., rachis pubescent; leaflets solitary, or a terminal and one pair of opposite leaflets, oblong rhomboid or rounded, base rounded truncate or at times cordate, thickly membranous, green glabrous above, finely reticulate-veined, pubescent beneath, 1–2 in. long ·75–1 in. wide; lateral pair of leaflets when present always much smaller than terminal; petiole ·5–·75 in.; stipules lanceolate ·2 in.; stipels subulate small. *Racemes* in short dense simple oblong heads, 1–2·5 in. long, ·8 in. wide; bracts subpersistent distinctly ciliated, ·3 in. long; pedicels densely crinite, ·15 in. long. *Calyx* ·12 in., lower teeth setaceous, densely plumose. *Corolla* pale-purple, ·2 in. long. *Pods* glabrous, joints thick, reticulate, ·15 in. long, ·08 in. wide, compressed. Miq. Flor. Ind. Bat. I, 268; Bak. in Flor. Brit. Ind. 156. *U. retusa* Wall. Cat. 5680. *Hedysarum lagopodioides* Linn. Sp. Pl. 1198. *H. lagopoides* Burm. Fl. Ind. 68, t. 53, f. 2. *Lespedeza lagopoides* Pers. Synops. II, 308. *Doodia lagopodioides* Roxb. Flor. Ind. III, 366.

Pahang; *Ridley* 2594! Perak; *Scortechini* 13! Prov. Wellesley; *Ridley* 8010! Andamans; *King's Collectors!* Distrib. India; Indo-China; China; Malay Islands.

39. Lourea Neck.

Herbs. *Leaves* membranous, stipellate, 1–3-foliolate. *Flowers* in terminal simple or panicled racemes. *Calyx* membranous, accrescent, the lanceolate teeth as long as the campanulate tube. *Corolla* equalling or exceeding the calyx; standard broad; keel obtuse. *Stamens* diadelphous; anthers uniform. *Ovary* few-ovuled; style filiform, inflexed, stigma capitate. *Pod* of about 4 small distinct 1-seeded smooth veined joints, included in the calyx. Species 4; all originally East Indian.

Lourea Vespertilionis Desv. Journ. Bot. I. 122, t. 5 f. 18. An erect slender herb, sparingly subfastigiately branched; branches towards their tips finely downy with hooked hairs. *Leaf-rachis* ·5–1 in., leaflets usually 1 terminal, rarely 3; rigidly subcoriaceous, green usually clouded with white, the terminal one 2–3 in. broad, ·3–·5 in. long with two linear or lanceolate spreading or slightly ascending 2–3-nerved halves, apex of each lobe broadly emarginate bristle-tipped; lateral leaflets, when present, much smaller, obliquely obversely deltoid. *Racemes* simple or slightly panicled; 3–6 in. long; pedicels pubescent, shorter than calyx, the lower geminate. *Calyx* membranous campanulate; in fruit ·25–·35 in. long, sparsely pubescent with spreading hairs; teeth as long as tube, wide-triangular with a strong central nerve and widely reticulate-veined, as is the tube, with slightly weaker secondary nerves. *Corolla* not longer than calyx. *Pod* included, 4–5-jointed. DC. Prodr. II, 323; Wall. Cat. 5671; Miq. Flor. Ind. Bat. I, 264; Bak. in Flor. Brit. Ind. II, 154. *Hedysarum Vespertilionis* Linn. fil. Suppl. 331; Roxb. Hort. Beng. 57; Flor. Ind. III, 352.

Malayan Peninsula; exact locality not given, *Sir W. Norris!* Distrib. Now cosmopolitan in the tropics, but often only planted.

40. Alysicarpus Neck.

Diffuse annuals or biennials. *Leaves* simple, rarely 3-foliolate, stipellate, subcoriaceous. *Flowers* in copious axillary racemes. *Calyx* glumaceous; teeth deep, often imbricated, the two upper often connate. *Corolla* not exserted; standard broad; keel obtuse, adhering to the wings. *Stamens* diadelphous; anthers uniform. *Ovary* nearly or quite sessile, many-ovuled; style incurved, stigma capitate. *Pod* terete or turgid, composed of several indehiscent 1-seeded joints. Species about 15; weeds, everywhere in the tropics of the old world.

Alysicarpus vaginalis DC.; Miq. Flor. Ind. Bat. I, 231. A robust ascending herb, stems 1–3 feet long (var. *typica*); or a dwarf diffuse herb with very slender stems and branches spreading 8–12 in. (var. *nummularifolia*); the branchlets slightly downy. *Leaves* always 1-foliolate, petioles ·3 in. long, slender, glabrous, stipules subscarious parallel-veined ovate-acute half as long as petioles; leaflets glabrous cordate at base, lowest lanceolate 1·5–2 in. long, ·5 in. broad acute, with upper oblong obtuse 1–1·5 in. long and 1 in. wide (in one series of forms); or lowest oblong ·75 in. long subacute, the upper ·5 in. long ovate-obtuse all ·3 in. wide (in a second series of forms). *Racemes* 8–12-fld. lax-fld. 1–3 in. long (var. *typica*) or congested under 1 in. long (var. *nummularifolia*); pedicels shorter than calyx. *Calyx* ·12 in. glabrescent, teeth linear-setaceous longer than tube. *Corolla* pale-yellow tinged with

pink, small, included. *Pod* terete, reticulate-veined, ·5–·75 in. long, ·08 in. wide; joints 6–8, half as long again as broad; faintly pubescent, slightly thickened at the ends. Bak. in Flor. Brit. Ind. II, 158.

Var. *typica*. Stems stouter ascending, lower leaves usually lanceolate and upper oblong, occasionally lower leaves oblong and upper ovate, racemes lax. DC. Prodr. II, 353; W. & A. Prodr. 233. *A. diversifolius* Wall. Cat. 5772. *A Harnieri* Schweinf. Rel. Kotsch. 24 t. 19. *Hedysarum vaginale* Linn. Sp. Pl. 746; Roxb. Hort. Beng. 56; Flor. Ind. III, 345.

Pangkore; *Scortechini* 1461! Malacca; on Pulo Besai, *Maingay* 516! Singapore; Changi, *Ridley* 1080!

Var. *nummularifolia* Miq. *loc. cit.*; Bak. *loc. cit.* Stems slender diffusely spreading, lower leaves always oblong, upper ovate, racemes dense. *A nummularifolius* DC. Prodr. II, 353; Wall. Cat. 5767; W. & A. Prodr. 133. *A. varius* Wall. Cat. 5768. *Hedysarum nummularifolium* Linn. Sp. Pl. 746. *H. varium* Roth. Nov. Sp. 354. *H. cylindricum* Poir. Encyc. Meth. Suppl. V, 400. *Hegetschweilera pulchella* Regel, Bot. Zeit. I, 47.

Andamans; Gt. Coco Isd. *Prain!* Port Blair, *King!* Perak; *Scortechini! Ridley* 8008! Penang; Water-fall, *Curtis* 1892! 1893! Malacca; *King! Hervey!* Singapore; on Pulo Obin, *Kunstler* 4!

The writer has followed Miquel and Baker in uniting these two plants which Linnæus, De Candolle, Wallich and Wight have endeavoured to keep distinct. The difficulty that has arisen in distinguishing them, has been due to the fact that *A. vaginalis*, though always diagnosed as having lower leaves lanceolate and upper leaves oblong, in reality very often has the lower oblong and the upper ovate as in *A. nummularifolius*. The true distinguishing characters are the spreading habit and condensed racemes of the variety, the ascending stems and lax racemes of the typical plant. The description and the varietal diagnoses now given may, it is hoped, prevent a recurrence of the difficulty that has hitherto been experienced in differentiating the two.

41. Desmodium Desv.

Herbs or shrubs. *Leaves* 1- or 3-foliolate, stipellate. *Flowers* small usually in copious often dense racemes. *Calyx* campanulate; teeth longer or shorter than the tube the two upper often subconnate. *Corolla* exserted; standard broad; wings more or less adherent to the usually obtuse keel. Upper *stamen* entirely or partially free from the other united 9. *Ovary* sessile or stipitate, few- or many-ovuled; style incurved, stigma minute capitate. *Pod* usually composed of several 1-seeded indehiscent joints, the faces compressed, the upper suture rarely finally splitting open, the joints usually separating. Species about 150; cosmopolitan in tropical and subtropical countries, a few in temperate N. America and temperate S. Africa.

Pod distinctly divided into several separating one-seeded joints:—
- Leaves 3-foliolate:—
  - Small trailing herbs with 1–3 axillary flowers (1. *Sagotia*):—
    - Pedicels hardly exceeding the petioles; leaflets obovate-cuneate, truncate or emarginate ... 1. *D. triflorum.*
    - Pedicels distinctly longer than petioles; leaflets oblong rounded at apex ... ... 2. *D. heterophyllum.*
  - Undershrubs or shrubs with woody branches:—
    - Bracts large, 2-foliolate, persistent (2. *Phyllodium*).. 3. *D. pulchellum.*
    - Bracts small. simple, deciduous:—
      - Flowers in dense short-peduncled axillary umbels (3. *Dendrolobium*):—
        - Leaflets smooth, veins beneath indistinct; pods glabrous ... ... 4. *D. umbellatum.*
        - Leaflets rugose, reticulate-veined beneath; pods strigose ... ... 5. *D. rugosum.*
      - Flowers in more or less elongated racemes:—
        - Lowest joint of pod distinctly stalked, *constrictions between joints reaching from lower almost to upper suture* (4*a*. *Eudesmodium* § *Podocarpium*) .. .. 6. *D. laxum.*
        - Lowest joint of pod sessile:—
          - Joints of pod not manifestly longer than broad:—
            - Joints of pod indehiscent, leaflets large acuminate (4*b*. *Eudesmodium* § *Dollinera*).. 7. *D. megaphyllum.*
            - Joints of pod opening along lower suture, leaflets small (4*c*. *Eudesmodium* § *Nicholsonia*):—
              - Leaflets obovate-cuneate silvery beneath; pedicels always ultimately reflexed; stems prostrate .. .. 8. *D. capitatum.*
              - Leaflets obovate-cuneate or obovate-acute, not silvery beneath; pedicels erect or ascending; stems erect ... 9. *D. polycarpum.*
          - Joints of pod 4 times as long as broad (4*d*. *Eudesmodium* § *Scorpiurus*) ... 10. *D. laxiflorum.*
- Leaves 1-foliolate:—
  - Petioles not winged:—
    - Joints of pod 4 times as long as broad (4*d*. *Eudesmodium* § *Scorpiurus*) ... ... 11. *D. ormocarpoides.*
    - Joints of pod not manifestly longer than broad (4*e*. *Eudesmodium* § *Heteroloma*):—
      - Racemes lax, pods glabrescent ... ... 12. *D. gangeticum.*
      - Racemes dense, pods densely pubescent ... 13. *D. virgatum.*
  - Petioles broadly winged (5. *Pteroloma*):—
    - Pods thin, densely strigose ... ... 14. *D. triquetrum.*

Pods coriaceous, quite glabrous ... ... 15. *D. auriculatum.*
Pods indistinctly jointed, not separating into segments but dehiscing in a continuous line along the ventral suture (6. *Pleurolobium*) ... ... 16. *D. gyroides.*

Subgen. 1. Sagotia Walp. Trailing *herbs*, with small 3-foliolate stipellate leaves. *Flowers* in sparse lax racemes or 1–2 in the axils of the leaves; bracts deciduous and pods distinctly jointed.

1. Desmodium triflorum DC. Prodr. II, 334. A small trailing herb with very slender diffusely branching stems 6–18 in. long; branches sparsely hirsute with fine spreading hairs. *Leaves* ·5 in. long, 3-foliolate; petiole ·2 in. long; leaflets membranous obovate-cuneate, apex truncate or emarginate, terminal ·25 in. long ·2 in across, lateral ·2 in. long ·15 in. across, glabrous above sparsely adpressed-hirsute beneath; stipels minute subulate, stipules persistent lanceolate ·15 in. long. *Inflorescence* of 1–3-fld. axillary fascicles; pedicels ·25 in., bracteoles minute. *Calyx* pubescent with longish white hairs ·1–·15 in. long; teeth setaceous longer than narrowly campanulate tube. *Corolla* pink or occasionally white ·2 in. long. *Pod* ·4–·6 in. long, ·15 in. wide; joints 3–5, reticulately veined and finely puberulous; upper suture straight, lower distinctly indented between the joints. Wall. Cat. 5734 (except part of F.); Benth. in Mart. Flor. Bras. XV, 95, t. 26; Miq. Flor. Ind. Bat. I, 238; Bak. in Flor. Brit. Ind. II, 173. *D. triflorum* var. *minus* W & A. Prodr. 229; Wight Ic. t. 292. *D. heterophyllum* Wall. Cat. 5701 C. *Hedysarum triflorum* Linn. Sp. Pl. 749; Roxb. Hort. Beng. 57; Flor. Ind. III, 353. *H. stipulaceum* Burm. Flor. Ind. t. 54, f. 2. *Nicholsonia reptans* Meissn. in Linnaea XXI, 260. *Sagotia triflora* Walp. & Duch. in Linnaea XXIII, 738.

Andamans; Port Blair, *Kurz! Prain!* Great Coco Island (specns. all white-fld.) *Prain!* Malacca; *Maingay* 522! Prov. Wellesley; *King!* Penang; *Wallich* 5734 I! Distrib. Cosmopolitan in the tropics.

An extremely common species in India, not so common in Indo-China; very rare, perhaps only a recently introduced weed, in Malaya.

2. Desmodium heterophyllum DC. Prodr. II, 334. A trailing herb with slender diffusely branching stems 2–2·5 feet long; branches densely hirsute with spreading hairs. *Leaves* 1–1·5 in. long, 3-foliolate, petiole ·5 in. long; leaflets membranous oblong or obovate-oblong apex rounded or subacute, terminal ·5–1 in. long, ·3–·5 in. wide, lateral similar ·25–·5 in. long ·2–·25 in. wide, glabrous above, hairy beneath; stipels minute subulate, stipules persistent lanceolate ·15 in. long. *Inflorescence* of solitary or geminate axillary flowers and, towards ends of branches, of a few axillary lax few-fld. racemes; pedicels ·5–·8 in. long, sparsely pubescent with rusty spreading hairs; bracts ·2 in. long, ovate-lanceolate, deciduous, bracteoles minute. *Calyx* ·15 in. densely hirsute,

teeth setaceous, longer than narrowly campanulate tube. *Corolla* pale-purple, ·25 in. long. *Pod* ·5–·75 in. long, ·18 in. wide; joints 4–5, reticulate, glabrescent except the lower suture, dehiscent; upper suture straight lower distinctly indented between the joints. Wall. Cat. 5701, letters A. B. D.; Miq. Flor. Ind. Bat. I, 238; Bak. in Flor. Brit. Ind. II, 173. *D. cæspitosum* DC. Prodr. II, 333. *D. triflorum* Wall. Cat. 5734, letter F. in part. *D. triflorum* VAR. *majus* W. & A. Prodr. 229; Wight, Ic. t. 291. *Hedysarum heterophyllum* Willd. Sp. Pl. III, 1201. *H. reptans* Roxb. Hort. Beng. 57; Flor. Ind. III, 354. *Dicerma repens* Grah. in Wall. Cat. 5740.

In all the provinces, very common. DISTRIB. Throughout tropical S.-E. Asia.

Though very like the preceding this is quite easily distinguished by its thicker stems, larger and differently shaped leaflets, much longer pedicels and rather broader pods, the joints of which usually dehisce along the lower suture.

The distribution in India and Malaya of these two species, is reversed. In India this is quite a rare plant, *D. triflorum* being common everywhere; in Malaya, on the other hand, *D. triflorum* is very rare while *D. heterophyllum* is extremely common and is apparently the representative of the other.

SUBGEN. 2. PHYLLODIUM Desv. *Shrubs* with woody branches and 3-foliolate leaves. *Flowers* umbellate, the umbels in long continuous rows, each hidden by a pair of persistent bracts.

3. DESMODIUM PULCHELLUM Benth. ex Bak. in Flor. Brit. Ind. II, 162. A small shrub 4–5 feet high with slender terete finely grey-downy branches. *Leaves* 5–6 in. long, 3-foliolate, petiole ·25–·4 in., channelled above, downy; leaflets coriaceous green subrugose above, finely downy beneath, narrow-ovate to ovate-lanceolate subacute, terminal 3–4 in. long 1·5 wide, on petiolules ·6 in. long; lateral pair much smaller, 1·25 in. long, ·75 in. wide, petiolules ·15 in. long; lateral nerves 10–12 pairs, very oblique distinctly raised beneath, secondary reticulate cross-venation visible; stipels subulate as long as petiolules, stipules ·25 in. long subscarious closely parallel-veined, subpersistent. *Inflorescence* axillary or terminal, 3–10 in. long, in racemes of solitary flowers, fascicles, or small subumbellate corymbs, in the axils of 12–40 compound foliar bracts; *bracts* 2-foliolate, their stipules ·2 in. and petiole ·15 in. long, leaflets opposite subobliquely orbicular ·5 in. across, glabrous externally, finely downy internally, on very short stipellate petiolules, their terminal leaflet reduced to a bristle ·2–·25 in. long; fascicles or close-set corymbs 2–6-fld.; pedicels slightly unequal, ·08–·10 in., downy. *Calyx* ·1 in. puberulous, teeth lanceolate shorter than tube. *Corolla* ·25 in. yellow. *Pod* ·2–·3 in. long indented on both sutures slightly puberulous; joints 2, less often solitary, very rarely 3, ·1 in. long, ·12 in. broad. *Hedysarum pulchellum* Linn. Sp. Pl. 747; Roxb. Flor. Ind. III, 361.

Zornia pulchella Pers. Synops. II, 318. *Dicerma pulchellum* DC. Prodr. II, 339; Wall. Cat. 5737; Wight, Ic. t. 418. *Phyllodium pulchellum* Desv. Journ. Bot. III, 123, t. 5, f. 24; Benth. Pl. Jungh. 217; Miq. Flor. Ind. Bat. I, 260.

Malacca; *Griffith.* Pahang; *Ridley* 2596! Johore; *Kunstler* 376! Perak; *Scortechini!*

Subgen. 3. Dendrolobium W. & A. *Shrubs* with woody branches and 3-foliolate leaves. *Flowers* in dense short-peduncled or sessile axillary umbels, bracts minute deciduous.

4. Desmodium umbellatum DC. Prodr. II, 325. A littoral shrub 5–15 feet high with densely downy terete young branches. *Leaves* 5–7 in. long, 3-foliolate, petiole 1 in. long, channelled above, rusty-puberulous; leaflets subcoriaceous, green glabrous above, paler and thinly canescent underneath, ovate-oblong obtuse or rarely acute or subacute, terminal 3–3·5 in. long, 2–2·5 in. wide on a petiolule ·5 in. long, the lateral pair similar but smaller 2–2·5 in. long, 1·25–1·75 in. wide on petiolules ·2 in. long; lateral nerves 6–8 pairs hardly raised beneath; stipels very small, subulate, half as long as petiolules; stipules large ·3 in. long, subscarious, closely parallel-veined, caducous with the unfolding of leaf next above which they cover in bud. *Inflorescence* axillary, with peduncles ·35 in. long, in 6–12-fld. corymbs simulating umbels; pedicels short ·15 in. or less, elongating in fruit to ·25 in., unequal, very close-set. *Calyx* with a broad scarious deciduous bracteole, ·1 in. long ·07 in. wide, at its base, densely silky externally, ·15 in. long, teeth lanceolate, as long as tube. *Corolla* ·5 in. long, white. *Pod* 1·5–2 in. long, joints 4, very rarely 5, ·3 in. long, ·25 in. wide, sparsely silky when young, glabrous when ripe, thick and coriaceous almost turgid. W. & A. Prodr. 224; Wall. Cat. 5687; Bak. in Flor. Brit. Ind. II, 161. *Dendrolobium umbellatum* Benth. Pl. Jungh. 218; Miq. Flor. Ind. Bat. I, 262. *Hedysarum umbellatum* Linn. Sp. Pl. 747. *H. arboreum* Roxb. Flor. Ind. III, 360.

In all the provinces, common on the coasts. Distrib. On all coasts from the Mascarene Islands to Polynesia.

A curious variety of this species, with branches, leaves beneath, and ripe pods softly silky, is var. *hirsutum* DC. It is known only from specimens cultivated in Hort. Calcutta (*Wall. Cat.* n. 5687/D) and in Hort. Bogor.—the Buitenzorg specimens being marked "*E horto Calcuttensi recepta.*" The original habitat of this variety is unknown.

D. umbellatum has been said to occur in Upper Burma; this is a mistake caused by Dr. Wallich having issued (as 5687/*β*) a totally different species under the same name. No one has ever sent specimens of *D. umbellatum* to Calcutta except from sea-coasts and the shores of tidal rivers.

5. Desmodium rugosum Prain. A large gregarious shrub with

rusty-puberulous angular young branches. *Leaves* 5–7 in. long, 3-foliolate, petiole 1 in. long, channelled above, rusty-puberulous; leaflets coriaceous rugose, puberulous on the midrib and nerves above, densely rusty-puberulous beneath on the midrib lateral nerves and secondary veins; obovate-acute, terminal 4 in. long 2·5 in. wide, on a petiolule ·5 in. long; lateral pair oblong-acute base obliquely rounded, 3·5 in. long 1·75–2 in. wide, on petiolules ·15 in. long; lateral nerves 10–12 pairs very prominent beneath as is the close reticulate secondary venation; stipels subulate, ·12 in., nearly as long as petiolules; stipules subscarious caducous. *Inflorescence* axillary, with peduncles ·25 in. long, in 3–6-flo. corymbs simulating umbels but with the rachis produced for ·3 in. or more in the centre and marked by numerous close-set scars left by fallen pedicels; pedicels that persist ·2 in. long, elongating slightly in fruit. *Calyx* with a broad scarious deciduous bracteole ·1 in. long at its base, pubescent externally, ·2 in. long, teeth longer than tube. *Corolla* ·5 in. long, white. *Pod* 1·5 in. long, joints 4, ·3 in. long ·25 in. wide, densely adpressed-pubescent with coarse rusty hairs, thick, coriaceous, almost turgid.

Kedah; Langkawi, *Curtis* 2550! Distrib. Tenasserim.

Very nearly related to the preceding species but with quite different foliage and pods. Very nearly related also to *D. Wallichii* (*D. umbellatum* Wall. Cat. n. 5687 *letter* B only) from Upper Burma, but with larger pods, and coarser, more rugose acute leaves than in that species; indeed, *D. Wallichii* with the inflorescence of *D. rugosum* has foliage more resembling that of *D. umbellatum*. The stipules of *D. Wallichii* do not fall immediately after the unfolding of the leaf next above, as in the case of *D. umbellatum* and *D. rugosum*.

Desmodium (Dendrolobium) *Cephalotes* Wall. is stated by Dr. Miquel to occur in Java. No Malayan specimens of the species, which is very common throughout India and Indo-China, have yet reached Calcutta. Its presence, however, would not be surprising and the species should be looked for by collectors in the Malay Peninsula.

Subgen. 4. Eudesmodium. Erect *herbs* or *undershrubs* with large 1–3-foliolate leaves. *Flowers* often 2 or several from a node in long racemes simple or panicled, bracts deciduous and pods distinctly jointed.

§ Podocarpium Bth. Joints of pod indehiscent, longer than broad, the lowest one distinctly stalked, constrictions reaching from lower nearly to straight upper suture.

6. Desmodium laxum DC. Prodr. II, 336. A bush 2–4 feet high with angular erect finely-puberulous branches. *Leaves* 5–8 in. long, 3-foliolate, petiole 1–2·5 in., channelled above, finely sparsely puberulous; leaflets membranous, green and glabrous above, paler and sparsely hirsute on the nerves beneath, terminal narrow ovate, 4–6 in. long 1·5–2 in. wide, narrowed gradually to apex, cuneate at base on a petiolule ·75 in.

long, lateral nerves 3 pairs the lowest much stronger than the rest and very oblique; side leaflets similar but smaller, 3–4 in. long 1–1·5 in. wide, with slightly oblique bases; stipels subulate ·2 in. long; stipules linear-lanceolate ·5 in. long, persistent. *Inflorescence* in rather narrow terminal and axillary racemes, the former sometimes paniculate, 12–20 in. long, composed of as many distant solitary flowers or few-fld. fascicles, bracts minute linear; pedicels puberulous slender ·2 in., ultimately spreading ·4 in. long. *Calyx* very small ·08 in. long, tubular, slightly pubescent, teeth deltoid very short. *Corolla* pink, ·25 in. long. *Pod* 1–3 in. long, the lowest joint on a stalk ·3 in. long, joints few indehiscent ·5 in. long, ·2 in. wide, the constrictions nearly reaching the upper suture, cut obliquely from opposite the point to the base. *D. Gardneri* Bth. Pl. Jungh. 226; Miq. Flor. Ind. Bat. I, 255; Bak. in Flor. Brit. Ind. II, 165. *D. podocarpum* Miq. Ann. Mus. Lugd. Bat. III, 46 not of DC.

Perak; on Ulu Batang Padang, *Wray* 1608! Distrib. India; Himalayas; Indo-China; China; Malay Archipelago.

§ Dollinera Endl. Joints of pod indehiscent, hardly longer than broad, upper suture straight or slightly indented; calyx teeth not exceeding tube.

7. Desmodium megaphyllum Zoll. Nat. en Geneesk. Arch. III, 58. A straggling shrub 8 feet high with slightly grooved, blackish branches, with a sparse short tomentum. *Leaves* 7–9 in. long, 3-foliolate, petiole 2–2·5 in., channelled above, sparsely tomentose; leaflets subcoriaceous, green sparsely puberulous above, grey thickly softly woolly beneath; rhomboid ovate-acuminate terminal cuneate at base, 4–6 in. long, 2·5–3·5 in. wide, on petiolule 1–1·5 in. long; lateral pair similar but smaller 3–4 in. long, 1·5–2·5 in. wide with obliquely rounded base; lateral nerves 5–6 pairs very oblique; stipels linear ·25 in. long; stipules subscarious ·15 in. long, lanceolate. *Inflorescence* longer than the leaves, in axillary and terminal racemes, the latter sometimes panicled, 8–10 in. long, of 25–30 few-fld. fascicles; pedicels slender ·4 in. long, bracts ·5 in. long, subscarious, lanceolate, bracteoles minute subulate. *Calyx* campanulate ·15 in. long, teeth triangular as long as tube. *Corolla* pale-violet, ·3 in. long. *Pod* dull-crimson, 2–2·25 in., 6–8-jointed, joints ·25 in. long ·2 in. wide, indehiscent, slightly puberulous, finely reticulate-veined, slightly indented on the lower suture. Miq. Flor. Ind. Bat. I, 245, excluding synonyms.

Perak; upper part of Batang Padang Valley, at 2,000 feet, *Wray* 1441! Distrib. Java, Tenasserim.

§ Nicholsonia DC. Joints of pod dehiscent along lower suture, not longer than broad; upper suture straight, lower slightly indented.

8. Desmodium capitatum DC. Prodr. II, 336. A prostrate under-

shrub with elongated woody rounded branches, hoary-tomentose towards their tips, sometimes reaching 6 feet in length. *Leaves* 2–2·5 in. long, 3-foliolate, petiole ·6 in. long slightly grooved and glabrescent above, adpressed-tomentose beneath; leaflets subcoriaceous, green glabrescent above, densely white-silky pubescent beneath; obovate-cuneate apex rounded, terminal 1·25 in. long, 1 in. across, lateral similar but smaller ·75 in. long, ·5 in. across, lateral nerves about 8 pairs slightly visible beneath; stipels subulate ·1 in. long, stipules linear ·25 in. long. *Inflorescence* of dense axillary and terminal subsessile racemes 1–2 in. long; pedicels ·2–·25 in., abruptly reflexed in fruit; bracts small ovate-cuspidate ciliate, bracteoles minute. *Calyx* ·1 in., glabrescent, teeth setaceous longer than tube. *Corolla* purplish-red, ·2 in. long. *Pods* faintly puberulous, ·5–·75 in. long ·15 in. wide; joints 6–8, dehiscent along lower indented suture. Miq. Flor. Ind. Bat. I, 241; Bak. in Flor. Brit. Ind. II, 170. *D. obovatum* Wall. Cat. 5722 B. *D. polycarpum* W. & A. Prodr. 227, in part. *Hedysarum capitatum* Burm. Fl. Ind. 167, t. 64, f. 1. *H. conicum* Poir. Encyc. Meth. VI, 419. *Pseudarthria capitata* Hassk. Pl. Jav. Rar. 390.

Perak; Durian, S. Batang, *Kunstler* 361! Thaipeng, *Scortechini!* Pahang; Palàn Tawa, *Ridley* 2598*a*!

9. Desmodium polycarpum DC. Prodr. II, 334. An erect or suberect undershrub or shrub 2–5 feet high with woody angular slender branches shortly tomentose towards their tips. *Leaves* 2–4 in. long, 3-foliolate, petiole ·6–1 in. long, slightly grooved glabrous above, sparsely adpressed-pubescent beneath; leaflets subcoriaceous, pale-green glabrous above, thinly adpressed-hirsute beneath, usually obovate-cuneate apex round, sometimes ovate-acute (*D. ovalifolium* Wall.), 1·25–3 in. long 1–1·5 in. across, lateral similar but smaller, ·75–1·25 in. long ·5–·75 in. across, lateral nerves about 6 pairs indistinct; stipels subulate ·2 in. long, stipules linear ·3 in. long. *Inflorescence* of dense axillary and terminal subsessile racemes 1–4 in. long; pedicels ·2 in. long ascending; bracts ovate-cuspidate ciliate ·25 in. long, bracteoles minute. *Calyx* ·1 in., glabrescent, teeth setaceous longer than tube. *Corolla* pinkish-purple, ·2 in. long. *Pods* usually faintly or (*D. ovalifolium*) densely ciliate, ·5–·75 in. long. ·15 in. wide; joints 6–8, dehiscent along lower indented suture. W. & A. Prodr. 227; Wight Ic. t. 406; Miq. Flor. Ind. Bat. I, 242; Bak. in Flor. Brit. Ind. II, 171. *D. angulatum* Wall. Cat. 5727 in part, not of DC. *D. siliquosum* DC. Prodr. II, 336. *D. heterocarpum* DC. Prodr. II, 337. *D. retusum* G. Don, Gen. Syst. II, 297. *D. gyroides* Hassk. Pl. Jav. Rar. 362, not of DC. *D. Buergeri* Miq. Ann. Mus. Lugd. Bat. III, 45. *D. nervosum* Vogel, Pl. Meyen, 28. *D. patens* Wight Ic. t. 407. *Hedysarum polycarpum* Lamk. Ill. t. 628.

H. siliquosum Burm. Fl. Ind. 169, t. 55, fig. 2. *H. heterocarpon* Linn Sp. Pl. 747. *H. purpureum* Roxb. Hort. Beng. 57; Fl. Ind. III, 358. *H. retusum* Don Prodr. 243. *H. patens* Roxb. Fl. Ind. III, 362.

Var. *typica;* leaves obovate-cuneate rounded at apex; pods faintly puberulous.

In all the provinces, extremely common. Distrib. East Africa, India, Malaya, Indo-China, China, Polynesia.

Var. *ovalifolia;* leaves ovate-acute base rounded or truncate; leaflets beneath sometimes softly silky; pods pubescent with spreading hairs. *D. ovalifolium* Wall. Cat. n. 5730.

Penang; *Wallich!* Perak; Goping, *Kunstler* 1007! Distrib. Sumatra (*Forbes* n. 1256!)

There are several more or less distinct forms of *D. polycarpum* most of which are readily recognisable, though all are connected with each other and with typical *D. polycarpum* by means of many intermediates. The form here defined as var. *ovalifolia* has no intermediates, however, and so far as material hitherto collected goes, might even be treated as a separate species. But its habit and its flowers are so exactly those of *D. polycarpum* that it seems better to consider the differences of leaves and fruit as merely varietal.

§ Scorpiurus Bth. Joints of pod indehiscent much longer than broad constricted along both sutures.

10. Desmodium laxiflorum DC. Prodr. II, 335. An erect undershrub 2–5 feet high with woody slender obtusely angled stems, at first densely clothed with short hairs at length glabrescent. *Leaves* 6–20 in. long, 3-foliolate, petiole 1·5–2·5 in., pubescent with adpressed hairs, grooved above; leaflets membranous or subcoriaceous, green and glabrous above, sparsely adpressed-hirsute beneath, terminal ovate-acute base rounded or cuneate, 4–6 in. long 1·5–3 in. across with petiolule 1 in. long, lateral nerves prominent beneath 7–10 pairs; lateral leaflets similar but smaller 1·5–2·5 in. long, 1·–1·5 in. wide, base obliquely rounded, petiolule very short; stipels subulate ·2 in. long; stipules ovate long-acuminate, ·3 in. long. *Inflorescence* in axillary and terminal racemes 6–10 in. long, of 12–20 distant solitary flowers or few-fld. fascicles; bracts and bracteoles minute linear or setaceous; rachis puberulous with adpressed hairs as are the ultimately patent pedicels ·2–·25 in. long. *Calyx* ·1 in., pubescent, tube campanulate, teeth lanceolate as long as tube. *Corolla* white, ·2 in. long. *Pod* 1–1·75 in. long, pendulous, ·1 in. wide, joints ·3 in. long, indehiscent, hardly constricted at the sutures and not ribbed, closely beset with short hooked hairs. Miq. Flor. Ind. Bat I, 251; Bak. in Flor. Brit. Ind. II, 164. *D. bicolor* Wall. Cat. 5719. *D. elongatum* Wall. Cat. 5715. *D. leptostachyum* Wall. Cat. 5697 B. *D. sulcatum* Wall. Cat. 5736. *D. recurvatum* Grah. in Wall. Cat. 5717; W. & A. Prodr. 226; Wight Ic. t. 374. *D. diffu-*

sum DC. Prodr. II, 335, non 336. *Hedysarum recurvatum* Roxb. Hort. Beng. 57; Fl. Ind. III, 358; Wight, Ic. t. 409. *H. diffusum* Roxb. Fl. Ind. III, 357, not of Willd. *H. Roxburghii* Spreng. Syst. App. 292. *H. Rottleri* Spreng. Syst. III, 320.

Andamans; Great Coco, *Prain!* Nicobars; Kondil, *Kurz!* Distrib. Throughout India, Indo-China and Malaya.

11. Desmodium ormocarpoides DC. Prodr. II, 327. An erect undershrub 2–5 feet high with woody slender obtusely angled stems, at first densely clothed with short hairs at length glabrescent. *Leaves* 5–7 in. long, 1-foliolate, petiole ·75 in. long, pubescent with spreading hairs, channelled above; leaflet subcoriaceous, green and glabrous above, sparsely pubescent to closely silky beneath, ovate-acute, base rounded or truncate, 4–6 in. long 1·5–2·25 in. wide, lateral nerves 6–8 pairs visible beneath; stipels subulate, ·2 in. long; stipules ovate long-acuminate scarious, ·3 in. long, subpersistent. *Inflorescence* in terminal or rarely axillary racemes 6–10 in. long, of 12–20 distant solitary flowers or few-fld. fascicles; bracts and bracteoles minute linear or setaceous; rachis puberulous with rusty tomentum as are the ultimately patent pedicels ·25–·35 in. long. *Calyx* ·1 in. pubescent, tube campanulate, teeth short deltoid. *Corolla* white, ·2 in. long. *Pod* 3–4 in. long, pendulous, ·15 in. wide; joints 6–8, ·6 in. long, indehiscent, constricted at both sutures, longitudinally ribbed, closely beset with short hooked hairs. Miq. Flor. Ind. Bat. I, 249; Bak. in Flor. Brit. Ind. II, 164. *Hedysarum adhaerens* Poir. in Lamk. Encyc. Meth. V, 15 not of Vahl. *H. ormocarpoides* Desv. ex DC. Prodr. II, 327. Rumph. Herb. Amboin. VI, t. 66.

Var. *velutina;* leaves softly silky beneath. *D. zonatum* Miq. Flor. Ind. Bat. I, 250.

Andamans; common in the interior of the Islands. Selangor; *Ridley* 7295! Pahang; Kwala Tembeling, *Ridley* 2605! Distrib. Java.

The typical form of this species has leaves very sparsely hairy beneath; it occurs in Java (*fide* De Candolle), and is common in India from Ceylon and the Pulney Mts. northwards to Assam.

§ Heteroloma Bth. Joints of pod indehiscent, hardly longer than broad; upper suture straight or slightly indented; calyx-teeth exceeding tube.

12. Desmodium gangeticum DC. Prodr. II, 327. A slender undershrub 1–4 feet high with woody obtusely angled glabrescent stems and angled adpressed-puberulous branches. *Leaves* 4–6 in. long, 1-foliolate, petiole ·75 in. long channelled and with a few adpressed hairs above; membranous or rarely subcoriaceous, green and glabrous above, a little paler adpressed-puberulous beneath; ovate-acute, base rounded or truncate, 3–5·5 in. long 1–2 in. wide, lateral nerves 8–9 pairs slightly

visible on both surfaces, cross-nervation slightly visible beneath; stipels subulate ·2 in. long; stipules linear subpersistent ·25 in. long. *Inflorescence* in copious ascending terminal and axillary racemes 6–12 in. long, of 30–40 rather close-set few-fld. fascicles; bracts and bracteoles minute setaceous; rachis adpressed-puberulous as are the fastigiate pedicels ·2–·25 in. *Calyx* finely pubescent, ·08 in., teeth lanceolate longer than campanulate tube. *Corolla* white, ·15 in. long. *Pod* subfalcate, ·5–·75 in. long, ·1 in. across, 6–8-jointed, indented on upper suture, joints indehiscent slightly longer than broad, minutely puberulous with hooked hairs. Wall. Cat. 5689; Miq. Flor. Ind. Bat. I, 247; W. & A. Prodr. 225; Wight, Ic. 271; Bak. in Flor. Brit. Ind. II, 168. *D. latifolium* Wight, Ic. t. 272 not t. 270. *Hedysarum gangeticum* Linn. Sp. Pl. 746; Roxb. Flor. Ind. III, 349. *H. collinum* Roxb. Flor. Ind. III, 349.

Penang; Pinara Bukit, *Curtis* 2771! Nicobars; Teressa, etc., *Jelinek* 233! *King's Collectors!*

13. Desmodium virgatum Zoll. Nat. en Geneesk. Arch. III, 58. A slender undershrub 1–4 feet high with angled adpressed-pubescent stems and branches. *Leaves* 4–6 in. long, 1-foliolate, petiole ·25 in. long channelled above, densely rusty-tomentose; membranous or subcoriaceous, pale-green glabrous above, adpressed-puberulous beneath; ovate-acute, base rounded or truncate, margin slightly sinuate, 3–5 in. long 1–2 in. wide, lateral nerves 8–9 pairs slightly visible on both surfaces; stipels subulate ·2 in. long; stipules short triangular, ·15 in. long. *Inflorescence* in copious ascending terminal and axillary racemes 3–8 in. long, of 20–30 close-set few-fld. fascicles; bracts and bracteoles minute setaceous, rachis densely rusty-tomentose; pedicels very short, ·08 in., glabrescent. *Calyx* glabrescent, ·08 in., teeth lanceolate longer than campanulate tube. *Corolla* pale-pink, ·2 in. long. *Pod* subfalcate, ·5–·75 in. long, ·1 in. across, 6–8-jointed, indented or upper suture, joints indehiscent as long as broad, densely clothed with short hooked hairs. Zoll., Flora (1847) 697. *D. latifolium* var. *virgatum* Miq. Flor. Ind. Bat. I, 247. *D. gangeticum* var. *acuminatum* Miq. Flor. Ind. Bat. I, 248. *D. latifolium* Bak. in Flor. Brit. Ind. II, 168, in part, hardly of DC.

Perak; Batu Kuran, *Scortechini* 1594! Distrib. Chittagong, Burma, Java.

This has the habit and foliage of *D. gangeticum*, but in flowers and especially in fruits, it more resembles *D. latifolium* to which indeed Miquel and Baker have referred it.

Subgen. 5. Pteroloma Desv. *Shrubs* with 1-foliolate leaves and winged petioles. *Flowers* racemose, bracts minute and keel acute.

14. Desmodium triquetrum DC. Prodr. II, 326. A shrub with

grooved triangular glabrescent branches. *Leaves* 5–6 in. long, 1-foliolate; petiole 1 in. long ·3 in. wide, with broad leafy reticulate-veined wings; blade 4–5 in. long ·75–1 in. wide, narrowly oblong-lanceolate with rounded or subcordate base and acute apex, green and glabrous on both surfaces, lateral nerves 15–20 pairs and secondary cross reticulate venation distinct on both surfaces especially beneath; stipules very large, ·5–·75 in. long ·2 in. wide, subscarious, closely parallel-veined persistent, stipels small adnate to upper margin of petiolar wing. *Inflorescence* in narrow axillary and terminal racemes 6–10 in. long, of solitary or fascicled flowers in the axils of 20–40 simple scarious bracts resembling foliar stipules with similar but much smaller stipulets at their base; pedicels ascending ·2–·3 in. long. *Calyx* ·15 in. long, very sparsely hairy, bracteolate at base, bracteoles narrow scarious linear; tube campanulate, teeth unequal, upper deltoid lower linear. *Corolla* purple, ·3 in. long. *Pod* 1–2 in. long, joints 6–8, thin, ·2 in. long, ·25 in. wide, densely persistently strigose with subadpressed greyish-brown hairs. Bak. in Flor. Brit. Ind. II, 163 in part only, the synonyms *D. alatum*, *D. auriculatum* and *D. pseudo-triquetrum* excluded. *Hedysarum triquetrum* Linn. Sp. Pl. 746. *H. alatum* Roxb. Flor. Ind. III, 348. *Pteroloma triquetrum* Benth. Pl. Jungh. 220; Miq. Flor. Ind. Bat. I, 258 excluding the synonyms *Desmodium pseudo-triquetrum* and *D. alatum*.

Andamans; common in the interior of the Islands. Perak; *Kunstler* 1074! *Scortechini!* Distrib. India and Indo-China.

This species is very easily recognised by its hairy pods. Some difficulty is at times found in separating flowering specimens of this from flowering specimens of the next species; the two are however quite distinct. Equally distinct are two other species, *D. alatum* and *D. pseudo-triquetrum*, quite justly differentiated by De Candolle but merged in *D. triquetrum* by Miquel, who has been followed in the *Flora of Brit. Ind.*

15. Desmodium auriculatum DC. Prodr. II, 326. A littoral shrub with grooved triangular glabrescent branches. *Leaves* 4–5 in. long, 1-foliolate, petiole 1 in. long ·3 in. wide, with broad leafy reticulate-veined wings; blade 3–4 in. long 1–1·5 in. wide, oblong or ovate-acute with truncate or cordate base and acute apex, green and glabrous on both surfaces, lateral nerves 10–12 pairs and secondary cross reticulate venation distinct on both surfaces, especially beneath; stipules large ·5 in. long ·2 in. wide, subscarious, closely parallel-veined, persistent, stipels adnate to tip of petiolar wing. *Inflorescence* in axillary and terminal racemes 5–8 in. long, of solitary or fascicled flowers in the axils of 12–20 simple scarious bracts; pedicels ascending, ·3 in. long. *Calyx* ·15 in. long, sparsely hairy, base bracteolate; tube campanulate shorter than the unequal teeth. *Corolla* purple, ·3 in. long. *Pod* 1–2 in. long,

joints 6–8 stoutish coriaceous, ·25 in. long ·3 in. wide, quite glabrous, polished. *D. triquetrum* Bak. in Flor. Brit. Ind. II, 163 in part, not of DC. *Pteroloma auriculatum* Miq. Flor. Ind. Bat. I, 258.

ANDAMANS; coasts of Great Coco, *Prain!* of South Andaman, *Playfair! Kurz! Prain!* DISTRIB. Indo-China; Malay Archipelago.

Though common in Tenasserim where it has been collected by Wallich (n. 5788 M!) and Helfer (n. 1648!) as well as in Mergui where it has been obtained by Griffith (n. 568!) and Proudlock (n. 14!), this is not present in Calcutta from any locality within the Straits Settlements. It is rather more closely related to *Desmodium alatum*, which has broader pods, than to the preceding species, but it is equally distinct from both. It appears to be an almost exclusively littoral form; there are however two inland gatherings at Calcutta, both from Silhet and both collected by Mr. Clarke (n. 14352! and n. 42702!).

It should be noted that *Hedysarum alatum* Roxb. is not the species described by De Candolle as *Desmodium alatum*; Roxburgh's *H. alatum* is exactly equivalent to Linnæus' *H. triquetrum*. Roxburgh's *H. triquetrum* on the other hand is not Linnæus' plant but is *Desmodium pseudo-triquetrum* DC., a species confined to Northern India, the lower Himalayan slopes, and the mountains of Assam. *D. alatum* DC., the plant with broad pods described in the *Prodromus*, occurs in Khasia, Cachar and Chittagong without appearing in India proper or in Burma and the Malay Peninsula; it recurs, however, in Java. The present species, *D. auriculatum*, has not been found in Java but is met with again in Timor.

SUBGEN. 6. PLEUROLOBIUM DC. Erect *undershrubs*, with large leaves. *Flowers* racemose; *pods* indistinctly jointed, dehiscing in a continuous line along the ventral suture.

16. DESMODIUM GYROIDES DC. Prodr. II, 316. A shrub about 10 feet high with terete sparsely pubescent branches. *Leaves* 2·5–3 in. long 3- or often only 1-foliolate, petiole ·75 in. long, slender glabrescent; leaflets membranous, oblong or ovate-oblong obtuse, pale-green glabrous above, very thinly adpressed-pubescent beneath, 1·75–2 in. long, 1–1·25 in. wide, lateral nerves 6–8 pairs visible beneath; lateral leaflets if present similar but much smaller, ·5 in. long, ·4 in. wide. *Inflorescence* in dense axillary and terminal at first strobilate racemes, with large imbricating scarious soon deciduous ovate-acute bracts, ·25 in. long ·2 in. wide, pedicels finely-pubescent at length patent, ·25 in. long. *Calyx* ·1 in., wide-campanulate, teeth triangular half as long as tube. *Corolla* ·35 in. long, ·2 in. across, purple. *Pod* 1–1·5 in. long, ·2 in. wide, falcate; joints 6–10, dehiscing along the lower slightly indented suture but not separating from each other, copiously pubescent with a felted rusty tomentum. Wall. Cat. 5728; W. & A. Prodr. 227; Miq. Flor. Ind. Bat. I, 243; Bak. in Flor. Brit. Ind. II, 175. *D. pseudogyroides* Miq. Flor. Ind. Bat. I, 244. *Hedysarum gyroides* Roxb. Hort. Beng. 57. *Codariocalyx gyroides* Hassk. Flor. (1842) Beiblatt. II, 49. *C. conicus* Hassk. in Walp. Rep. I, 744. *Pseudarthria polycarpa* Hassk. Pl. Jav. Rar. 393.

Perak; Kinta river, *Kunstler* 765! Distrib. India, Indo-China, Malaya.

42. Sophora Linn.

Trees or shrubs. *Leaves* odd-pinnate. *Flowers* showy, yellow or white or violet-purple, racemed or panicled. *Calyx* oblique subgibbous broadly campanulate; teeth deltoid very short. *Corolla* much exserted, standard broad; petals equal in length all with long claws; keel obtuse. *Stamens* free or only obscurely connate at the very base; anthers uniform versatile. *Ovary* stalked, many-ovuled; style incurved, stigma capitate. *Pod* moniliform, sublignose or membranous usually indehiscent, the joints turgid and usually terete. Species about 25; widespread in tropical and subtropical regions, a few temperate or alpine.

The above definition applies to the section *Eusophora*, to which the only Malayan species belongs.

Sophora tomentosa Linn. Sp. Pl. 373. An evergreen littoral shrub or small tree sometimes reaching 20 feet in height, with all parts at first softly and shortly tomentose. *Leaves* 6–12 in. long, leaflets 10–17 terminal and in subopposite pairs or often along proximal half of rachis distinctly alternate, elliptic to oval-obtuse 1–1·5 in. long, ·5–·75 in. wide, thinly coriaceous, with age glabrescent above, persistently softly pubescent beneath, petiolules very short densely pubescent as is the rachis. *Flowers* in terminal racemes 6 in. long on softly tomentose pedicels, ·3 in. long, with deciduous subulate basal bracteoles, ·15 in. long. *Calyx* obliquely truncate, ·35 in. long, obsoletely toothed, externally softly pubescent. *Corolla* yellow, glabrous, ·65 in. long; standard orbicular veined. *Stamens* almost free to the base, the vexillary filament quite free, the filaments of the other 9 very shortly connate round base of pubescent 10–12-ovuled ovary. *Pod* moniliform 6–8-seeded, 4–6 in. long, the oblong hoary joints separated by stipes as long as themselves. DC. Prodr. II, 95; Wall. Cat. 5333; Roxb. Flor. Ind. II, 316; W. & A. Prodr. 179; Miq. Flor. Ind. Bat. I, 124; Bak. in Flor. Brit. Ind. II, 249. *S. glabra* Hassk. Cat. Hort. Bog. 285; Miq. Flor. Ind. Bat. I, 125 (*fide* Baker).

Kedah; Langkawi, *Curtis!* Dindings; on coast, *Scortechini! Curtis!* Perak; Larut, *Ridley!* Pulo Condor; on the coast, *Finlayson!* Andamans; very common on all the coasts. Distrib. On most tropical seacoasts.

43. Ormosia Jacks.

Erect trees or, one species, climbing. *Leaves* odd-pinnate. *Flowers* usually in dense terminal racemes. *Calyx* campanulate, deeply 5-cleft,

the two upper teeth usually distinctly subconnate into an upper lip. *Corolla* slightly exserted, petals subequal in length, all short-clawed; standard orbicular sometimes emarginate; keel petals free, and wings oblong, obtuse. *Stamens* free or only faintly subconnate at the very base, much incurved and exserted when the flower expands; anthers oblong, versatile. *Ovary* subsessile; style long, filiform, circinate at the tip with an oblique stigma on the inner face. *Pod* thickly fleshy or woody, or thinly woody, turgid 2-valved continuous within, the sutures without wings. *Seeds* bright red, with or without arillus. Species about 25, cosmopolitan in the tropics.

Climber; (leaves quite glabrous beneath) ... ... 1. *O. scandens.*
Trees:—
Seeds large with a black adnate basal aril; (leaves minutely sparsely pubescent underneath):—
Panicles fastigiate, flowers white, pedicels stout; pods 3 in. wide, seed 1 in. long ... ... 2. *O. macrodisca.*
Panicles lax, flowers yellow, pedicels slender; pods 1·25 in. wide, seed ·75 in. long ... ... 3. *O. gracilis.*
Seeds small without any aril:—
Leaves quite glabrous beneath; (pod ·6 in. broad, ·4 in. thick, valves thinly woody) ... ... 4. *O. nitida.*
Leaves pubescent beneath:—
Leaflets distinctly petiolulate; pedicels shorter than calyx; pod with thinly woody valves ·6 in. broad, ·4 in. thick:—
Leaflets (9–13) small (not exceeding 2·5 in.) shortly acuminate (dark green thinly pubescent beneath)... 5. *O. parviflora.*
Leaflets larger (4 in long) acute or subobtuse:—
Leaflets thinly pubescent beneath, pale-green, 7–9; branches thin; panicles lax, bracts small; pubescence grey ... ... 6. *O. sumatrana.*
Leaflets densely pubescent beneath, dark-green, 11–13; branches very thick; panicles fastigiate, bracts conspicuous; pubescence rusty ... 7. *O. microsperma.*
Leaflets sessile; pedicels almost equalling calyx; pod with thickly woody valves 1·35 in. wide, 1 in. thick ... 8. *O. venosa.*

1. Ormosia scandens Prain. A large climber over 100 feet long with stem 6–8 in. in diam.; branches glabrous. *Leaves* 12–15 in. long; leaflets 5–7, ovate-oblong or the terminal slightly obovate, coriaceous, bright-green, quite glabrous on both surfaces, apex shortly acuminate base rounded, 6–9 in. long, 2·5–3 in. across; secondary nerves 13–18, fine ultimate reticulations rather distinct beneath. *Racemes* in ample terminal panicles, 12 in. long 6 in. across, with pale-tawny shortly puberulous rachis and branches, pedicels ·2 in. long, pale-tawny silky, shorter than the calyx, with a minute deciduous basal and 2 subulate

apical persistent bracteoles, ·08 in. long, close under calyx. *Calyx* ·25 in. long, finely grey-silky, three lower teeth deltoid as long as calyx-tube, two upper subconnate into a shortly bifid upper lip. *Corolla* ·35 in. long, white with a reddish tinge, standard ·25 in. across. *Stamens* quite free, incurved, exserted. *Ovary* with line of hairs along upper suture, elsewhere glabrous, ovate; style slightly contorted; ovules 3. *Pod* unknown.

Perak; Larut, *Kunstler* 3560!

A very distinct species differing from the rest in its scandent habit. Mr. Kunstler speaks of it as rare.

2. Ormosia macrodisca Bak. in Flor. Brit. Ind. II, 253. A large tree with very thick grey glabrous branches. *Leaves* 8–10 in. long, leaflets 7–9, oblong, very thick and rigid in texture, pale grey-green on both surfaces, quite glabrous above, with a very sparse adpressed pubescence of short hairs beneath, apex acute, base broadly rounded to cuneate, 3–5 in. long, 1·25–2 in. broad, secondary veins 7–9 pairs, faintly prominent beneath. *Racemes* crowded in terminal fastigiate panicles, 6 in. long, 3 in. wide, with brown-silky puberulous rachis and branches, pedicels ·1–·15 in., brown-silky, shorter than calyx, with a minute basal and 2 minute apical persistent bracteoles close under calyx. *Calyx* ·3 in. long, finely brown-silky, three lower teeth two-thirds, two upper teeth one-third as long as tube, all teeth oblong-obtuse. *Corolla* ·5 in. long, white; standard ·4 in. across. *Stamens* quite free, incurved, exserted. *Ovary* glabrous, obliquely oblong, ovules 3. *Pod* hard thick irregularly orbicular, 3 in. across ·75 in. thick, at first flattened, at length turgid opposite the usually solitary seed. *Seed* oblong, 1 in. long, ·7 in. wide, bright scarlet, with an adnate, black, pitted aril, ·2 in. deep, embracing its base.

Malacca; *Maingay* 600! Singapore; *Ridley* 2103!

3. Ormosia gracilis Prain. A slender tree with very thin pale-brown glabrous branches. *Leaves* 5–8 in. long, leaflets 7–9, ovate-lanceolate, chartaceous, pale grey-green on both surfaces, quite glabrous above, with a very sparse adpressed pubescence of short hairs beneath, apex caudate-acuminate, base cuneate, 2·5–3 in. long, 1 in. across, secondary veins 8–9 pairs, very faint beneath not visible above. *Racemes* in lax terminal panicles, 5 in. across, with slender branches 6 in. long, faintly adpressed grey-silky as is the rachis, pedicels grey-silky, ·15 in. long, very slender, rather shorter than calyx, with lanceolate basal bract, ·08 in. long, and 2 very minute triangular apical bracteoles at base of calyx. *Calyx* ·25 in. long, finely silky, pale-green, teeth ovate-lanceolate, longer than calyx-tube except the two upper. *Corolla* pale-yellow, ·35 in. long; standard ·25 in. across. *Stamens* quite free, much

incurved, exserted. *Ovary* puberulous, ovate-lanceolate; ovules 2. *Pod* hard, thick, irregularly oblong-ovate, with a short stalk and slightly excentric acute point, 1·5 in. long, 1·25 in. wide, externally covered with a pale blueish bloom; inside white. *Seed* usually solitary, oblong, ·75 in. long, ·6 in. wide, somewhat compressed, bright scarlet, with an adnate, black, smooth aril, ·15 in. deep, embracing its base.

PERAK; Larut, *Scortechini* 324! *Kunstler* 4234! *Wray* 2979!

A very fine species; near to *O. macrodisca*, but with a smaller pod and seed as well as with smaller leaflets; the seed too has the black arillar portion unpitted. It resembles *O. glauca* as to leaves though its leaflets are not quite so large; it has however larger seeds than *O. glauca* has, and the seeds have a black hilum; the seeds of *O. glauca* are all scarlet.

4. ORMOSIA NITIDA Prain. A tree 30–50 feet high, stem 2 feet in circumference, with stout rusty-brown glabrescent branches. *Leaves* 5–7 in. long, leaflets 7, obovate or elliptic, base rounded, apex broadly rounded and abruptly shortly cuspidate, very rigidly coriaceous, dark glossy-green quite glabrous on both surfaces, terminal 2·5–4 in. long, 1·3–2 in. wide, rather exceeding the others, secondary nerves very slender, 12–15 pairs. *Racemes* in fastigiate terminal panicles, 6–8 in. long, 5–6 in. across, rachis and branches faintly puberulous, pedicels puberulous, ·15 in. long, shorter than calyx, bracts and bracteoles deciduous. *Calyx* ·2 in. long, rather densely tawny-silky, teeth deltoid, the 3 lower as long as tube the two upper subconnate into a 2-fid upper lip. *Corolla* unknown. *Pod* irregularly oblong, 1 in. long ·75 in. across, the valves thinly woody, rigid, quite glabrous and black externally, brown and not suberous within, with a short stalk equalling the calyx-tube. *Seed* oval, usually if not always solitary, cinnabar-red, ·35 in. long ·3 in. wide, without arillus.

PERAK; Goping, in open jungle, local, *Kunstler* 6082!

This very distinct species has unfortunately only been reported in fruit. Its pods are very like those of *O. microsperma* or *O. parvifolia* but appear to have been glabrous from the beginning. They differ, moreover, very markedly in being shortly stipitate; the leaflets too, are of different shape and firmer texture, besides being quite glabrous on both surfaces.

5. ORMOSIA PARVIFOLIA Bak. in Flor. Brit. Ind. II, 253. A fairly large tree with slender persistently brown-velvety branches. *Leaves* 6–8 in. long, leaflets 9–13, oblong, coriaceous, green, glossy above, thinly hairy beneath, apex shortly acuminate, base rounded, the terminal rather larger than the others, 2–2·5 in. long, ·6–·7 in. wide, secondary nerves fine and hardly raised beneath, 8–9 pairs. *Racemes* in fastigiate terminal panicles with rather short branches, 3–4 in. long, 2·5 in. wide, with densely brown-velvety rachis and branches, pedicels brown-velvety, very short, each with an ovate-lanceolate basal bract and with 2 ovate

bracteoles under the calyx. *Calyx* ·2 in. long, densely brown-silky, the teeth triangular, the three lower as long as the calyx-tube the two upper rather shorter. *Corolla* apparently white, ·35 in. long, standard ·25 in. across. *Stamens* quite free, incurved, exserted. *Ovary* ovate, densely silky, ovules 3. *Pod* orbicular, 1-seeded, or oblong and lineate between the seeds if 2–3-seeded, shortly stipitate, valves thin, rigid, at first densely silky soon glabrescent and black externally, reddish-brown inside. *Seeds* ovoid, ·3 in. long, ·25 in. wide, cinnabar-red, without arillus. *Macrotropis bancana* Miq. Flor. Ind. Bat. Suppl. 295.

Malacca; *Griffith* 1765! *Maingay* 614! *Goodenough* 1443! Singapore; *Ridley* 5929! 8096! Pahang; *Ridley* 1267! 5013! Distrib. Banka (*Teysmann* 3405!); Borneo (*Haviland* 57!)

There is an authentic example of *Macrotropis? bancana* Miq. at Calcutta; it belongs undoubtedly to this species.

6. Ormosia sumatrana Prain. A large tree with tomentose rather slender ultimately glabrescent branches. *Leaves* 8–10 in. long, leaflets 7–9 (very rarely 5), ovate or ovate-elliptic or obovate, obtusely apiculate or subacuminate, base rounded, coriaceous, pale-green, glabrous somewhat glossy above, hirsute but at length glabrescent beneath as are the rachis and petiolules, 2–4 in. long 1–1·75 in. wide, the terminal exceeding the others, nerves 8–10 pairs, spreading rather prominent beneath. *Racemes* in lax terminal panicles, 6–8 in. long and almost as wide, with pubescent rachis and branches; pedicels ·1 in. long, shorter than the calyx, bracts ·1 in. long, oblong, very deciduous as are the similar bracteoles at base of pedicels, the two bracteoles under the calyx sub-persistent, lanceolate, ·08 in. long. *Calyx* ·2 in., externally tawny-pubescent, three lower teeth ovate-lanceolate shorter than tube, the two upper subconnate in a 2-lobed upper lip. *Corolla* pinkish-white with lilac-purple markings, ·35 in. long, standard orbicular emarginate, ·3 in. wide. *Stamens* quite exserted, incurved. *Ovary* densely puberulous, almost always 3-ovuled. *Pod* irregularly orbicular if 1-seeded, 1 in. across, oblong and 1·7 in. long if 2-seeded, lineate between the seeds, the valves thinly woody, rigid, black and glabrescent externally. *Seed* ovoid ·4 in. long, ·35 in. wide, cinnabar-red without arillus. *Macrotropis sumatrana* Miq. For. Ind. Bat. Suppl. 294.

Malacca; Brisu, *Holmberg* 735! Distrib. Sumatra (*Teysmann* 3618! *Forbes* 2592! 2648!)

Though very closely related to the next species, this is nevertheless easily distinguished by its different leaves and tomentum, its lax panicles, its smaller flowers, and its larger seeds.

The Malacca plant here referred to *O. sumatrana* has been only once collected; it has inflorescence and flowers exactly as in. *O sumatrana* but it has not yet been sent in fruit. While therefore we know that it differs from *O. microsperma* and from *O. venosa* it is not absolutely certain that it exactly agrees with *O. sumatrana*.

7. Ormosia microsperma Bak. in Flor. Brit. Ind. II, 253. A tree 40 to 60 feet high with thick, densely brown-velvety branches. *Leaves* 8–10 in. long, leaflets 11–13, oblong or obovate, acute or subobtuse, base broadly rounded, rigidly coriaceous, dark-green, glabrous rather glossy above, densely persistently shortly brown-pubescent beneath as are the rachis and petiolules, 2·5–4 in. long 1·5–2 in. wide, secondary nerves 7–9 pairs, slightly raised beneath. *Racemes* in ample terminal fastigiate panicles, 8 in. long, 6 in. across, with densely velvety rachis and branches; pedicels ·07–·12 in. long, much shorter than the calyx, bracts ovate-lanceolate, densely velvety, persistent, ·25 in. long, bracteoles at base of pedicels similar but smaller (·12 in. long), two bracteoles close under calyx ·1 in. long, oblong. *Calyx* ·25 in. long, externally densely velvety, 3 lower teeth as long as calyx 2 upper rather shorter. *Corolla* white, ·45 in. long, standard ·35 in. wide. *Stamens* quite free, exserted, incurved. *Ovary* densely velvety, 3–4-ovuled. *Pod* ·6 in. across, irregularly orbicular if 1-seeded, oblong and 1–1·2 in. long if 2-seeded, lineate between the seeds, the valves thinly woody, rigid, glabrescent or persistently velvety. *Seed* ovoid ·3 in. long, ·25 in. wide, cinnabar-red, without arillus.

Var. *typica;* pedicels very short, pods when ripe glabrescent. *O. coarctata* Kurz, Journ. As. Soc. Beng. XLII, 2. 71 hardly of Jackson.

Malacca; *Griffith* 1759! *Maingay* 532! *Derry* 1090! Perak; near Ulu Selangor, *Kunstler* 8767!

Var. *Ridleyi;* pedicels distinct, pods more persistently pubescent.

Singapore; Selitar, *Ridley*, 5574!

The specimens collected by Dr. Griffith have been named by Mr. Bentham "*Ormosia coarctata?* Jacks." and those collected by Dr. Maingay have been definitely issued as *Ormosia coarctata;* Mr. Kurz too, has accepted this determination. Mr. Baker however finds that the identification of Griffith's and Maingay's Malacca plant with *O. coarctata* Jackson (*Trans. Linn. Soc.* X, t. 25; a plant from Guiana) cannot be sustained.

Ormosia microsperma is nearly related to *O. sumatrana* (*Macrotropis sumatrana* Miq.) and is also closely related to *Chænolobium septemjugum* Miq. and *C. decemjugum* Miq. (*Flor. Ind. Bat. Suppl.* 302). Mr. Kurz reduces the genus *Chænolobium* to *Ormosia* (*Journ. As. Soc. Beng.* XLII, 2. 71); in this he is certainly right. He, however, further considers that both plants are but forms of the same species and that moreover they are both referable to *O. microsperma.* So far as the material that was at Kurz' disposal goes this appears to the writer to be a premature conclusion, and it seems better for the present to keep Miquel's plants specifically apart.

Mr. Ridley's plant from Singapore differs very considerably from the Perak and Malacca one. The pods are described as hairy in the field note; they are so in the specimens themselves, but those at Calcutta are not quite ripe. If the pods prove to be quite *persistently* velvety it will probably be necessary to treat the plant as a distinct species to be named *O. Ridleyi.*

8. Ormosia venosa Bak. in Flor. Brit. Ind. II, 254. A tall tree, with branches densely persistently velvety-pubescent. *Leaves* 4–6 in. long, leaflets 7, obovate-oblong, obtuse or subobtuse, base cuneate nearly sessile on the rachis, rigidly coriaceous, greyish-green glabrous but dull above, densely persistently tomentose beneath, 3–4 in. long 1·5–2 in. across, terminal exceeding the rest, secondary nerves 10–12, distinctly raised beneath, rachis densely velvety. *Racemes* terminal crowded, with rather slender branches, 3–4 in. long and about as wide, rachis and branches densely velvety; pedicels ·2 in. long, nearly equalling the calyx, bracts ·15 in. long, lanceolate, persistent, bracteoles at base of pedicels ·1 in. long, 2 bracteoles under calyx minute but subpersistent. *Calyx* ·25 in. long, densely velvety, teeth triangular, three lower as long as tube, two upper subconnate. *Corolla* ·35 in. long, apparently white, standard ·3 in. across. *Stamens* incurved, exserted. *Ovary* velvety. *Pod* obtuse or subacute, orbicular or oblong, obtuse or subacute, 1·5 in. long, 1·35 in. across, ·1 in. thick, the valves very thickly woody, black and glabrous externally. *Seeds* usually solitary, ovoid, ·5 in. long, ·4 in. wide, crimson-red, without arillus.

Malacca; *Maingay* 533!

A very distinct species.

Suborder II. Cæsalpinieæ.

Trees or shrubs, very rarely herbs. *Leaves* pinnate or 2-pinnate leaflets 1–∞-paired, rarely simple or 1-foliolate, stipels usually 0, if present very minute. *Inflorescence* racemose, rarely cymose, very rarely spicate; axillary, lateral, or in terminal panicles. *Flowers* irregular or very rarely regular, 5-, less often 4-merous. *Sepals* 5, or 4 from fusion of the upper two, divided to the summit of the disc that lines the short or long calyx-tube, imbricate or rarely valvate, or very rarely united in a toothed or lobed limb. *Petals* 5, or fewer by abortion, the upper innermost in bud, the others variously imbricate. *Stamens* 10, or fewer by abortion, very rarely indefinite, free or rarely some or all more or less connate; anthers various. *Ovary* free or united by its stipe to the disc-bearing calyx-tube. *Seeds* various, albumen copious, scanty, or 0. *Radicle* straight or slightly oblique, hidden between cotyledons, or shortly exserted.

Leaves simply pinnate or (*Bauhinia*) 1-foliolate:—
Anthers basifixed:—
Leaves even-pinnate; (petals 5) ... ... 44. Cassia.
Leaves odd-pinnate; leaflets alternate:—
Petals 5; stamens 5; pod flat, winged throughout its circumference, indehiscent ... ... 45. Koompassia.

Petals 2 or 0; stamens 2; pod turgid subglobose, wingless, dehiscent ... ... 46. DIALIUM.

Anthers versatile :—

Corolla complete, *i.e.*, with 5 petals; sepals 5; (stamens free) :—

Seeds with albumen; leaves 1-foliolate 2-lobed, rarely entire, rarely by fission 2-foliolate ... ... 47. BAUHINIA.

Seeds without albumen; leaves even-pinnate, 2–3- (rarely 1-) jugate ... ... 48. CYNOMETRA.

Corolla incomplete, *i.e.*, with fewer than 5 petals; sepals 4 :—

Petals present; sepals green; (leaflets even-pinnate) :—

Petals 3; stamens 3 monadelphous ... ... 49. TAMARINDUS.

Petal solitary :—

Calyx-lobes subvalvate; stamens monadelphous 9, all or only 2 perfect, *funiculus of seed thick arillate* ... ... 50. SINDORA.

Calyx-lobes much imbricated; stamens free 3 ... 51. AFZELIA.

Petals 0; sepals coloured :—

Leaflets even-pinnate; stamens 3–8 ... ... 52. SARACA.

Leaflets alternate; stamens 8–10 ... ... 53. CRUDIA.

Leaves 2-pinnate; (anthers versatile) :—

Calyx segments subequal; *stigma peltate* ... ... 54. PELTOPHORUM.

Calyx segments manifestly unequal, the lowest lobe cucullate larger than the rest :—

Pod wingless ... ... 55. CÆSALPINIA.

Pod winged :—

Wing extending all along the upper suture ... 56. MEZONEURON.

Wing apical, (pod samaroid) ... ... 57. PTEROLOBIUM.

44. CASSIA Linn.

Erect shrubs or trees, rarely herbs. *Leaves* simple, abruptly pinnate. *Flowers* usually large and showy, in axillary racemes and terminal panicles. *Calyx*-tube very short; sepals broad or narrow, imbricated. *Petals* 5, imbricated, subequal, usually broad. *Stamens* normally 10, but rarely all perfect, 3–5 being often reduced to staminodia or altogether absent; anthers mostly but not invariably basifixed, dehiscing by terminal pores or with the slit more or less continued longitudinally. *Ovary* sessile or stalked, many-ovuled; style incurved, stigma terminal. *Pod* very variable, terete or flat, usually septate, the albuminous seeds flattened, sometimes parallel with the valves, sometimes with the septa, dry, dehiscent or indehiscent. Species 340, spread everywhere in the tropics, a few extra-tropical.

Trees shrubs or stout herbs with large leaflets and with obtuse sepals :—
Stamens 10, all fertile :—
Lowest 2–3 stamens larger than the rest, pods terete indehiscent (§ *Fistula*) :—
Flowers pink, in dense corymbs, bracts large persistent :—
Leaflets acute, corymbs from old nodes below leaves, sepals green, petals acute ... ... 1. *C. nodosa.*
Leaflets obtuse, corymbs among leaves, sepals brown to purple, petals obtuse ... ... 2. *C. javanica.*
Flowers yellow, in lax racemes, bracts small deciduous ... ... 3. *C. Fistula.*
Lowest stamens not exceeding the rest, pods flat, dehiscent (§ *Psilorhegma*) ... ... 4. *C. glauca.*
Stamens 7 only fertile; the 3 upper reduced to staminodes (§ *Senna*); pods dehiscent, usually more or less compressed) :—
Leaves with glands on the common rachis :—
Glands between the bases of two opposed leaflets; leaflets obtuse, pods with oblique dissepiments; seeds rhombohedral :—
Glands between each of the two lower pairs of leaflets; pedicels short, pods subquadrate ... 5. *C. Tora.*
Gland between lowest pair of leaflets only; pedicels long, pods subterete ... ... 6. *C. obtusifolia.*
Glands far below leaflets and near base of petiole; leaflets acute, pods with transverse dissepiments; seeds ovate, compressed :—
Calyx, leaves and pods densely tomentose; flowers in subsessile axillary pairs ... 7. *C. hirsuta.*
Calyx, leaves and pods glabrous; flowers in axillary corymbs :—
Leaflets 3–5 pairs; pods flattened ... 8. *C. occidentalis.*
Leaflets 8–12 pairs; pods turgid ... 9. *C. Sophera.*
Leaves with rachis channelled above, barred transversely between the leaflets but without glands :—
Shrubs with flowers in strobilate subspicate racemes; pods winged along the valves; leaflets reaching 6 in. ... ... 10. *C. alata.*
Trees with flowers in panicles of corymbs; pods not winged; leaflets not exceeding 2·5 in. :—
Stipules large persistent; pod thin-valved flexible, with narrow sutures ... ... 11. *C. timoriensis.*
Stipules small deciduous; pod with coriaceous rigid valves, sutures thickened ... ... 12. *C. siamea.*
Slender herbs or undershrubs with very small leaflets and with acute sepals (§ *Chamæcrista*) :—
Leaflets linear minute (·15 in. long); pedicels 1 in.

bracteolate above middle ; pod 20–25-seeded ; stamens all fertile alternately short and long ... ... 13. *C. mimosoides.*
Leaflets oblong (·4 in. long, ·15 in. wide); pedicels ·3 in. bracteolate below middle ; pod 8–16-seeded ; stamens unequal 1–3 upper often sterile ... ... 14. *C. Leschenaultiana.*

§ 1. Fistula DC *Sepals* obtuse, stamens all antheriferous, the 2–3 lowest larger than the rest and with longer filaments. *Pods* indehiscent, stipitate, very long, terete with thin brittle ligneous dissepiments between the numerous seeds which are embedded in suberous wad-like discs between the partitions.

1. Cassia nodosa Ham. in Roxb. Hort. Beng. 31. A tree 40–50 feet high, stem 10–15 inches across, branches spreading, branchlets black glabrous except for the slightly downy tips. *Leaves* equally pinnate 9–10 in. long ; leaflets chartaceous 6–12 pairs, opposite, oblong, base rounded, apex shortly acuminate, 2–2·5 in. long, 1–1·25 in. wide, bright green, glabrous and shining above, dull and slightly pubescent, especially on the nerves, beneath ; lateral nerves spreading 12–16 pairs, slender but visible beneath, petiolules ·15 in. long, puberulous as is the leaf-rachis. *Flowers* in corymbs 2–3 in. long, from old nodes along the branches, peduncles solitary or 2–4 together, puberulous simple very rarely branched, 1 in. long, bracts ovate-lanceolate persistent, puberulous, ·25 in. long, pedicels puberulous the lower 1·5 in. long. *Calyx* 5-partite to the base, lobes subequal green, ovate-obtuse, hoary. *Petals* 5, subequal, carnation to white with a flush of pink, ·6–·7 in. long, ·25 in. wide ovate-acute, distinctly clawed. *Stamens* 10, all antheriferiferous, the 3 lowest with longer nodose filaments and larger anthers than the others. *Pod* terete, rather distinctly annulated, ·5 in. in diam., 1·5–2 feet long, glossy black with thin brittle ligneous transverse dissepiments between the 60–90 seeds each of which is embedded in a suberous disc ·5 in. across ·2 in. thick. *Seeds* broadly ovate smooth slightly shining, ·35 in. long, ·3 in across, ·2 in. thick, testa pale warm-brown. Wall. Cat. 5351 ; Roxb. Flor. Ind. III, 336 ; Wight, Ic. t. 410; Bak. in Flor. Brit. Ind. II, 261.

Andamans ; *King's Collectors !* Malacca ; *Griffith ! Maingay* 596 ! Bukit Tampin, *Goodenough* 1912 ! Brisu, *Derry* 537 ! Sadanan Reserve, *Derry* 588 ! Selandan, *Goodenough* 125 ! Penang ; Waterfall, *Curtis* 1576 ! Perak ; Chanderiang, *Kunstler* 5722 ! near Ulu Kerling, *Kunstler* 8732 ! Goping, *Kunstler* 4364 ! *Scortechini* 1934 ! Pahang ; Makang, *Ridley* 1359 ! Distrib. Indo-China, from Sylhet and Chittagong southwards and eastwards ; Sumatra (*Forbes* 1748 ! 2669 !) ; Borneo (*Haviland !*)

The Malay names given for this are *Siboosok* (*Goodenough* 1912) ; *Busok-busok* (*Derry* 537) ; and *S'busu* (*Goodenough* 125 ; *Derry* 588). This name it shares with

C. javanica. It seems that this species does not occur in Java, where *C. javanica* is its representative.

2. Cassia javanica Linn. Sp. Pl. 379. A tree 30–40 feet high, branches spreading; branchlets black glabrous except for the slightly downy tips. *Leaves* equally pinnate 9–15 in. long; leaflets chartaceous 8–20 pairs, opposite, oblong, base rounded, apex obtuse, 1·5–2 in. long, ·75–·9 in. wide, bright-green, glabrescent and slightly shining above, dull and uniformly puberulous beneath, lateral nerves rather oblique 10–12 pairs, slender but visible beneath, petiolules ·15 in. long, puberulous as is the leaf-rachis. *Flowers* in corymbs 6–10 in. long, terminal and from leaf-axils, sometimes paniculately branched, peduncles solitary, often with 1–2 small foliage leaves with 2–4 pairs of leaflets, puberulous, 4–6 in. long, bracts ovate-lanceolate ·4–·5 in. long, persistent, puberulous, pedicels puberulous the lowest 1·5 in. long. *Calyx* 5-partite to the base, lobes subequal crimson to purple-brown, ovate-obtuse, hoary. *Petals* 5 subequal, rose-pink, ·8–1 in. long, ·35 in. wide, broadly spathulate obtuse, distinctly clawed. *Stamens* 10 all antheriferous, the 3 lowest with nodose larger filaments and larger anthers. *Pod* terete, not very distinctly annulated, ·75 in. in diam., 1·25–1·5 feet long, glossy black, with thin brittle ligneous transverse dissepiments between the 50–75 seeds each of which is embedded in a suberous disc ·75 in. across ·2 in. thick. *Seeds* broadly ovate, smooth slightly shining, ·35 in. long, ·3 in. across, ·2 in. thick, testa pale warm-brown. DC. Prodr. II, 490; Wall. Cat. 5309; Benth. Pl. Jungh. 259; Miq. Flor. Ind. Bat. I, 90; Bak. in Flor. Brit. Ind. II, 267; Koord. & Val. Bijdr. II, 8. *C. Bacillus* Gaertn. Fruct. I, 313; Roxb. Hort. Beng. 31; Flor. Ind. II, 337; Wight, Ic. 252. Rumph. Herb. Amboin. II, 82, t. 22.

Perak; Thaipeng, *Wray* 4020! Distrib. Sumatra (*Forbes* 1275!); Java.

Mr. Wray is the only collector who has sent this very distinct species to Calcutta from the Malay Peninsula. The Malay name of this Mr. Wray gives as *Sibusu*, a circumstance that causes no surprise when it is considered how very closely related this species and *C. nodosa* undoubtedly are.

3. Cassia Fistula Linn. Sp. Pl. 377. A tree 20–40 feet high with spreading branches and glabrous branchlets. *Leaves* equally pinnate 8–16 in. long; leaflets coriaceous 4–6 pairs, developing successively, opposite, ovate, tapering from below the middle to a narrow point, base wide-cuneate, 2–6 in. long, 1·5–3·5 in. wide, bright-green, glabrous shining above, dull and paler beneath when young clothed with a close but very caducous silvery pubescence; lateral nerves obliquely spreading 10–20 pairs, slender but visible above somewhat prominent beneath, petiolules ·2 in. long stoutish, glabrous as is the leaf-rachis. *Flowers* in

long lax racemes 12–20 in. long, bracts minute caducous, pedicels glabrous 1·5–2 in. long. *Calyx* 5-partite to the base, segments broadly spathulate ·25 in. long, finely puberulous. *Petals* 5 subequal, obovate shortly clawed, ·8–1 in. long, ·6–·7 in. wide. *Stamens* 10 all antheriferous, the 3 lowest with larger and thicker but not nodose filaments, and with larger anthers. *Pod* terete, ·9–1 in. thick, not at all annulated, 1–2 feet long, dull black with thin brittle ligneous transverse dissepiments between the 50–90 seeds each of which is embedded in a suberous disc ·8–·9 in. across, ·2 in. thick. *Seeds* broadly ovate smooth shining, ·35 in. long, ·3 in. across, ·2 in. thick, testa pale warm-brown. DC. Prodr. II, 488; Roxb. Hort. Beng. 31; Fl. Ind. II, 333; Wall. Cat. 5302; W. & A. Prodr. 285; Miq. Flor. Ind. Bat. I, 89; Bak. in Flor. Brit. Ind. II, 261; Koord. & Val. Bijdr. II, 11. *C. rhombifolia* Roxb. Hort. Beng. 31; Flor. Ind. II, 334; Wight Ic. t. 269.

MALACCA; *fide* Baker in *Flor. Brit. Ind.* ANDAMANS; planted, common.

This is the well-known *Amaltás* or "Indian Laburnum" undoubtedly a native of India but, not in the writer's opinion, entitled to be considered an indigenous tree in Malaya; indeed none of the Malayan botanists have sent specimens to Calcutta. Mr. Baker however alludes to specimens at Kew from Malacca; possibly it is planted in the other provinces also. In the Andamans it only occurs as a planted tree.

§ 2. PSILORHEGMA Vogel. *Sepals* obtuse, stamens all antheriferous, anthers all subequal. *Pods* compressed, dehiscent, the dissepiments between the seeds membranous.

4. CASSIA GLAUCA Lamk Encyc. Meth. I, 647. A small tree 15–20 feet high with glabrous terete branches; stem 4–6 in. in diam. *Leaves* equally pinnate 6–9 in. long; leaflets 4–6 pairs opposite, membranous or subcoriaceous, pale-green glabrous above, very glaucous and sparsely adpressed-puberulous or glabrous beneath, ovate-acute, base cuneate, 2–4 in. long, 1–2 in. wide, lateral nerves 10–12 pairs indistinct, petiolules ·15 in. long, puberulous as is the rachis which is faintly channelled above and furnished with long conical glands between each of the 2–3 lowest pairs of leaflets; stipules falcate narrowly lanceolate ·35 in. long, caducous. *Flowers* in axillary corymbs 4 in. long, 2·5 in. across, the peduncles 2 in. long; lower pedicels 1·25 in. long, spreading, solitary in the axils of small elliptic caducous bracts glabrous as are the peduncles. *Calyx* 5-partite to the base, segments very unequal, pale-yellow, glabrous, all orbicular, the outer ·2, the others ·3 in. across. *Petals* 5 subequal, spreading, broadly ovate-obtuse shortly clawed, 1 in. long, ·75 in. across, pale-primose with faint greenish-yellow veins. *Stamens* 10 subequal. *Pod* straight flat very thin, dehiscent, linear, tapering to both ends, flexible, dull, slightly compressed between the seeds, valves thinly coriaceous, 6–8 in. long, ·5–·7 in. wide, with a stalk

·5–·6 in. long. *Seeds* biseriate, 20–30, oval, ·25 in. long, ·15 in. wide, very thin, testa dark-brown shining. DC. Prodr. II, 495; Wall. Cat. 5312; W. & A. Prodr. 289; Bedd. Flor. Sylvat. 91; Miq. Flor. Ind. Bat. I, 96; Bak. in Flor. Brit. Ind. II, 265. *C. surattensis* Burm. Flor. Ind. 97. *C. arborescens* Vahl. Symb. III, 56; Roxb. Hort. Beng. 31. *Senna arborescens* Roxb. Flor. Ind. II, 345.

Penang; *Kunstler* 1473! *Curtis*! Malacca; cultivated, *Maingay* 595! Perak; Simpang, *Wray* 2051! Distrib. S.-E. Asia generally, but often, perhaps usually cultivated.

§ 3. Senna Bth. & Hk. f. *Sepals* obtuse, perfect stamens 7, the 3 uppermost reduced to staminodes, the remainder subequal or the lowest 2–3 with longer filaments and larger anthers than the rest. *Pods* compressed, rarely subterete, usually dehiscent, the dissepiments between the seeds membranous.

5. Cassia Tora Linn. Sp. Pl. 376. An annual fœtid herb or undershrub 2–3 feet high. *Leaves* equally pinnate, distinctly petioled, 3–4 in. long; leaflets 3 pairs opposite, membranous, glaucous, obovate-oblong, uppermost leaflets 2 in. long 1 in. wide, lowest pair 1–1·25 in. long ·75 in. wide, apex equally acute, base slightly obliquely rounded, glabrous or puberulous on both surfaces, lateral nerves 8–10 pairs, oblique straight rather pronounced beneath, petiolules ·1 in. long, puberulous as is the rachis which is deeply grooved above and furnished with a long conical gland between each of the two lowest pairs of leaflets; stipules linear ·75 in. long, caducous. *Flowers* usually in subsessile pairs in axils of the leaves the upper crowded, their common peduncle even in fruit not exceeding ·15 in., usually shorter, the pedicels even in fruit not exceeding ·35 in. *Calyx* 5-partite to base, segments green ovate-acute glabrous spreading, ·2 in. long. *Petals* 5 subequal, spreading, pale-yellow, ·3 in. long, ·2 in. wide, oblong-obtuse, the standard retuse. *Stamens* 7 (the 3 upper replaced by staminodes) subequal, anthers brown. *Pod* 6–8 in. long, ·15 in. wide, nearly tetragonous, obliquely septate, the valves puberulous membranous not reticulated, sutures broad. *Seeds* 25–30, rhombohedral, long axis in direction of pod, ·15 in. long, ·1 in. thick, brown, shining. Linn. Sp. Pl. ed. II. 538 (excl. syn. *Roy. Lugd.* and excl. var. *β.*); DC. Prodr. II, 493; Roxb. Hort. Beng. 31; Collad. Hist. Cass. 96; Wall. Cat. 5316; W. & A. Prodr. 290 excl. var. *β.*; Miq. Flor. Ind. Bat. I, 90, excl. var. *β.*; Bak. in Flor. Brit. Ind. II, 263 in part only. *C. Tagera* Lamk. Encyc. Meth. I, 643 not of Linn. *C. fœtida* Salisb. Prodr. 326. *C. gallinaria* Collad. Hist. 96. *C. obtusifolia* Linn. Sp. Pl. ed. II, 539 as to all the citations except *Sloane, Hist. Jamaica*, but not as to the plant; Lour. Flor. Coch. Chin. 323; Miq. Flor. Ind. Bat. I, 95 excl.

VAR. *β. Senna Tora* Roxb. Flor. Ind. II, 340. Rumph. Herb. Amboin. V, t. 97, f. 3; Rheede, Hort. Malab. II, t. 53.

ANDAMANS; very common throughout the Settlement. PERAK; Kwala Dipong, *Scortechini* 1750! DISTRIB. A wide-spread weed in S.-E. Asia.

This is sometimes spoken of as cosmopolitan in the tropics and possibly it has now become introduced in the New World. But if so, it is not common there and the writer has never seen an American specimen.

6. CASSIA OBTUSIFOLIA Linn. Sp. Pl. 377. An annual bland herb or undershrub 2–7 feet high. *Leaves* equally pinnate, distinctly petioled 3–4 in. long; leaflets 3 pairs opposite, membranous, green, obovate-oblong, uppermost leaflets 2 in. long, 1 in. wide, lowest pair 1–1·25 in. long, ·75 in. wide, apex broadly equally deltoid, base slightly obliquely rounded, glabrous or puberulous on both surfaces, lateral nerves 8–10 pairs, oblique straight faint on both surfaces, petiolules under ·1 in. puberulous as is the rachis which is deeply grooved above and is furnished with a long conical gland between the lowest pair of leaflets; stipules linear ·75 in. long, caducous. *Flowers* usually in subsessile pairs in axils of the leaves the upper crowded, their common peduncle even in fruit not exceeding ·15 in. usually shorter, the pedicels even in flower 1–1·25 in. long. *Calyx* 5-partite to the base, segments green ovate-acute glabrous, spreading, ·25 in. long. *Petals* 5 subequal, spreading, bright-yellow, ·5 in. long, ·35 in. wide, oblong-obtuse, the standard truncate. *Stamens* 7 (the 3 upper replaced by staminodes) subequal, anthers brown. *Pod* 8–10 in. long, ·2 in. wide, sub-terete, obliquely septate, the valves glabrous, membranous, distinctly transversely reticulated, sutures broad. *Seeds* 30–35, rhombohedral, ·2 in. long, ·15 in. thick, brown shining. Linn. Sp. Pl. ed. II, 539 as to the plant but excl. the ref. to *Dillenius* and to *Rumphius*; DC. Prodr. II, 493; Collad. Hist. Cass. 95. *C. toroides* Roxb. Hort. Beng. 31. *C. humilis* Collad. Hist. Cass. 96. *C. Tora* VAR. *β.* Linn. Sp. Pl. 376. *C. Tora* VAR. *β.* W. & A. Prodr. 291 excl. references to *Rheede* and to *Lamarck;* Miq. Flor. Ind. Bat. I, 95. *C. Tora* Bak. in Flor. Ind. Bat. II, 263 in part, not of Linn. *C. obtusifolia* VAR. *β.* Miq. Flor. Ind. Bat. I, 96, not VAR. *α. Senna toroides* Roxb. Fl. Ind. II, 340.

SINGAPORE; common, *Hullett* 102! *Kunstler* 124! DISTRIB. Native in Tropical America; now introduced and, here and there, fairly common in South-Eastern Asia.

Dr. Roxburgh was at some pains to point out how different this species is from *C. Tora.* The confusion of indentification originated with Linnæus himself and has been perpetuated owing to the fondness that many authors have for books and names as compared with plants and facts.

7. CASSIA HIRSUTA Linn. Sp. Pl. 378. A diffuse tomentose under-

shrub 2–5 feet high usually of annual duration. *Leaves* equally pinnate 4–8 in. long; leaflets 3–6 (rarely 2) pairs, opposite, membranous, green, fœtid, ovate-acuminate with cuneate base, rather densely pilose on both surfaces, 1·5–3·5 in. long, 1–1·5 in. wide, lateral nerves about 6 pairs straight ascending, petiolules very short pilose as is the leaf-rachis which has a single large gland ·2 in. above its base; stipules subulate membranous ·35 in. long. *Flowers* usually in subsessile pairs in axils of leaves, the upper crowded, their common peduncle even in fruit not exceeding ·15 in., pedicels in fruit ·5 in. long, erect, rigid, pilose. *Calyx* 5-partite to base, segments pale, ovate-subacute, pilose externally, ·25 in. long. *Petals* 5, subequal, spreading, bright-yellow, ·45 in. long, ·25 in. wide ovate-oblong obtuse. *Stamens* 7 (the 3 upper replaced by staminodes) the 3 lower longer and with larger anthers than the two lateral pairs; anthers brown. *Pod* slightly falcate, 6–8 in. long, ·25 in. wide, subterete, faintly transversely septate, the valves densely villous, papery, very faintly reticulated and faintly depressed between the seeds, sutures broad. *Seeds* 90–120, ovate, small, dull-brown, ·15 in. long, ·1 in. wide, ·07 in. thick. DC. Prodr. II, 497; Bak. in Flor. Brit. Ind. II, 263. *C. tomentosa* Wall. Cat. 5304 not of Linn.

Singapore; very common, *Anderson* 44! *Hullett* 75! *Kunstler* 317! Distrib. An American weed now naturalised in many parts of S.-E. Asia.

8. Cassia occidentalis Linn. Sp. Pl. 377. A diffuse subglabrous undershrub 2–5 feet high usually of annual duration. *Leaves* equally pinnate 6–8 in. long; leaflets 3–5 pairs opposite, membranous, glaucous, fœtid, ovate-oblong with rounded base, tapering to an acuminate tip, glabrous above, glabrous or finely pubescent beneath, 1–3 in. long, ·5–1·25 in. wide; lateral nerves 6–10 pairs spreading, petiolules very short glabrous as is the leaf-rachis which has a single large globose gland at its base. *Flowers* in axillary short-peduncled few-fld. corymbs arranged in a terminal panicle, bracts white with pink tinge, thin, ovate-acuminate, caducous, ·5 in. long; pedicels ·15–·2 in. long, sparsely puberulous, spreading, in fruit reaching ·5 in. long, ascending, rigid. *Calyx* 5-partite to base, segments white faintly tinged with pink, glabrous, membranous, obtuse, ·3 in. long. *Petals* 5 subequal, yellow very faintly veined with orange, ·5 in. long, ·3 in. wide, ovate-obtuse. *Stamens* 7, (the 3 upper replaced by staminodes) the 3 lower longer and with larger anthers than the two lateral pairs; anthers brown. *Pod* slightly falcate, compressed, transversely septate, sutures rigid, valves depressed between the 20–30 seeds, 4–5 in. long, ·35 in. wide, ·2 in. thick. *Seeds* broadly ovate, small, pale-brown, ·2 in. long, ·15 in. across, ·1 in. thick. DC. Prodr. II, 497; Roxb Hort. Beng. 31; Bot. Reg. t. 83; W. & A. Prodr. 290; Miq.

Flor. Ind. Bat. I, 94; Bak. in Flor. Brit. Ind. II, 262. *C. fœtida* Pers. Synops. 1, 457. *C. Sophera* Wall. Cat. 5317 L. not of Linn. *Senna occidentalis* Roxb. Flor. Ind. II, 343.

In all the PROVINCES, a very common weed of waste places. DISTRIB. Cosmopolitan in the tropics but in all probability derived originally from America and only introduced in the Old World.

Mr. Baker describes the flowers as pale lilac; this they appear never to be in South-Eastern Asia.

9. CASSIA SOPHERA Linn. Sp. Pl. 379. A diffuse sub-glabrous shrub 8–10 feet high, annual or subperennial. *Leaves* equally pinnate 8–10 in. long; leaflets 8–12 pairs opposite, membranous, glaucous, lanceolate with cuneate base, apex acuminate, glabrous, 2–3 in. long ·5–·75 in. wide; lateral veins 10–12 pairs spreading; petiolules very short glabrous as is the leaf-rachis which has a single large conical gland ·2–·25 in. above its base. *Flowers* in axillary distinctly peduncled few-fld. corymbs, bracts green ovate-acute minute caducous, ·15 in. long, pedicels ·25 in. long sparsely puberulous spreading; in fruit reaching ·5 in. long ascending rigid. *Calyx* 5-partite to base, segments green glabrous firmly membranous obtuse ·25 in long. *Petals* 5 subequal, yellow, hardly at all veined, ·5 in. long, ·3 in. wide, ovate-obtuse. *Stamens* 7 (the 3 upper replaced by staminodes) the 3 lower longer and with larger anthers than the two lateral pairs, (sometimes one of these also reduced to a staminode). *Pod* slightly falcate, turgid, transversely septate, sutures slender, valves not depressed between the 30–40 small seeds, 3–4 in. long, ·35 in. wide, ·2 in. thick. *Seeds* broadly ovate rather dark-brown, ·24 in. long, ·15 in. across, ·1 in. thick. DC. Prodr. II, 492; Roxb. Hort. Beng. 31; Wall. Cat. 5317 partly; W. & A. Prodr. 287; Miq. Flor. Ind. Bat. I, 92; Bak. in Flor. Brit. Ind. II, 262. *C. esculenta* Roxb. Hort. Beng. 31. *C. chinensis* Jacq. Ic. t. 73. *C. frutescens* Mill. Dict. n. 2. *C. coromandeliana* Jacq. Fragm. 67, t. 100. *Senna Sophera* Roxb. Fl. Ind. II, 347. *S. esculenta* Roxb. Fl. Ind. II, 346. Rumph. Herb. Amboin. V, 283, t. 97, f. 1.

ANDAMANS; much less common than *C. occidentalis*. PENANG; *fide* Baker. DISTRIB. Originally American, now cosmopolitan in the tropics.

This species has not been sent by any Malayan botanist to the Calcutta Herbarium. Its presence in Penang is however mentioned by Mr. Baker; the collector's name is not given. It was not Dr. Wallich; Wallich's Malayan "*C. Sophera*" (Cat. 5317 L.) is all *C. occidentalis*. It is strange that though this species appears to have been earlier of introduction to—at all events to have been longer known—in S.-E. Asia, it is now, though almost equally wide-spread, much less "common" than the more recently introduced *C. occidentalis*.

10. CASSIA ALATA Linn. Sp. Pl. 378. A shrub 5–8 feet high with very thick finely downy branches; stem often 4–5 in. thick, scarred

with cicatrices of fallen leaves and marked by the persistent rather rigid stipules. *Leaves* equally pinnate 1–2 feet long; leaflets 8–14 pairs opposite, rigidly chartaceous, green, linear-oblong to oblong, obtuse or emarginate, apiculate, base obliquely rounded or truncate, glabrous on both surfaces or sometimes obscurely downy beneath, gradually increasing in size from base upwards, 2–6 in. long, 1–2·5 in. wide, lateral nerves 10–15 pairs ascending curved towards extremities, distinct above and very prominent beneath, secondary venation beneath distinct; petiolules very short glabrous as is the leaf-rachis, which is deeply channelled above with firm yellow borders and with transverse ridges occasionally slightly apiculate in the middle between each pair of leaflets, but with no true gland; stipules ·25 in. long, auriculate, rigid, pointed, persistent. *Flowers* in peduncled subspicate racemes, 6–18 in. long, at first enveloped in large membranous strobilate yellow caducous bracts ·75 in. long, ·6 in. wide, ovate, subacate or obtuse; pedicels ·15 in. (in fruit ·25 in.) long, very finely puberulous as is the thick rachis. *Calyx* 5-partite to base, segments spathulate obtuse, 1 in. long, ·6 in. wide, yellow, membranous, glabrous. *Petals* 5 subequal, bright yellow veined with orange, ovate-orbicular shortly clawed, 1·25 in. long, ·75 in. wide. *Stamens* 7 (the 3 upper reduced to staminodes) the 3 lowest with long filaments and two of these with very large anthers; the two lateral pairs with short filaments and small anthers. *Pod* straight rigid divaricately spreading glabrous dehiscent, 6 in. long ·8 in. wide, sutures narrow, valves with a crenulated chartaceous wing ·35 in. wide running from end to end. *Seeds* 50–60 flattened, triangular, the sides straight with acute point at hilum, the base somewhat rounded, ·25 in. long, ·2 in. wide, ·1 in. thick, testa smooth shining brown. DC. Prodr. II, 492; Roxb. Hort. Beng. 31; Wall. Cat. 5301; W. & A. Prodr. 287; Wight, Ic. t. 253; Miq. Flor. Ind. Bat. I, 93; Bak. in Flor. Brit. Ind. II, 264. *C. bracteata* Linn. f. Suppl. 232; DC. Prodr. II, 492. *C. herpetica* Jacq. Obs. II, 24, t. 45, f. 2. *Senna alata* Roxb. Flor. Ind. II, 349.

Andamans; common, *King! Prain!* Perak; *Scortechini!* Malacca; *Griffith!* Distrib. Cosmopolitan in the tropics.

11. Cassia timoriensis DC. Prodr. II, 499. A shrub or small tree 6–30 feet high, with virgate pubescent branches. *Leaves* equally pinnate, 1–1·5 feet long; leaflets 16–24 pairs, opposite, membranous, pale-green, glabrescent to densely pubescent above, sparsely pubescent to softly densely tomentose beneath, lanceolate-oblong with a fine point at the rounded apex and with obliquely rounded base, 1–1·75 in. long, ·35–·65 in. wide, lateral nerves 8–10 pairs inconspicuous, petiolules ·07 in. long, pubescent as is the rachis which is channelled above and trans-

versely barred between the leaflets; stipules lanceolate to auriculate foliaceous persistent, usually larger in the region of the inflorescence, ·25 in. long. *Flowers* in a large erect terminal panicle extending into the axils of the upper leaves, 1–1·25 feet long, 6 in. across, composed of alternate corymbs 2–3 in. long, 1·5 in. across; lower pedicels 1 in. long, solitary in axils of small deciduous bracts, rusty- or yellow-pubescent as are the branches and main-rachis. *Calyx* 5-partite to base, segments distinctly unequal, oblong-obtuse, densely pubescent outside, the larger ·3 in. the smaller ·2 in. long. *Petals* 5 oblong, ·6 in. long, ·3 in. wide, bright-yellow faintly veined with orange. *Stamens* 7 (the 3 upper reduced to staminodes) the 3 lower with longer filaments but not much larger anthers than the two lateral pairs. *Pod* straight, flat, very thin, dehiscent, linear, slightly tapering to both ends, glossy and flexible, valves thinly coriaceous, 5–6 in. long, ·5 in. wide, with a stalk ·3 in. long. *Seeds* biseriate, 16–20, oval-obtuse ·25 in. long, ·2 in. across, very thin, testa dark brown, shining, with a dull paler vertical central patch.

Var. *typica;* leaflets glabrescent above, sparsely pubescent beneath, stipules of the upper leaves narrower. *C. timoriensis* Miq. Flor. Ind. Bat. I, 99; Bak. in Flor. Brit. Ind. II, 265; Koord. & Val. Bijdr. II, 13.

Kedah; Coah Langkawi, *Curtis* 2094! Distrib. India; Indo-China; Malay Archipelago.

Var. *xanthocoma* Miq.; leaflets pubescent above, densely golden-tomentose beneath, stipules of the upper leaves very broad. *C. palmata* Wall. Cat. 5306 A. *C. xanthocoma* Miq. Analect. Ind. I, 10. *C. timoriensis* var. *xanthocoma* Miq. Flor. Ind. Bat. I, 99. *C. timoriensis* var. *chrysocoma* Koord. & Val. Bijdr. II, 14.

Perak; Kwala Dipong, growing near limestone, *Kunstler* 8255! *Scortechini* 1751! Goping, *Kunstler* 689! Ulu Bubong, *Kunstler* 10087! Distrib. Tenasserim, Malay Archipelago.

The two varieties are very easily distinguished but they do not differ at all in essentials. The Bornean specimens of *C. xanthocoma* first received by Miquel were without fruit; on seeing pods that author himself very justly reduced his species, as a variety, to *C. timoriensis.*

12. Cassia siamea Lamk Encyc. Meth. I, 648. A tree 30–50 feet high with smooth bark and spreading branches; stem 12–18 in. in diam. *Leaves* equally pinnate, 6–12 in. long; leaflets 4–16 pairs, opposite, subcoriaceous, rather dark-green shining above, dull and paler beneath, oblong-obtuse or retuse minutely mucronate, base rounded, 1·25–2·5 in. long, ·5–·9 in. wide, lateral nerves 10–12 pairs obscure above fine but distinct beneath, petiolules distinct ·1 in. long, glabrous as is the rachis which is channelled and is transversely barred between the leaflets above but is without glands; stipules minute subulate caducous.

Flowers in large erect terminal panicles extending into the axils of the upper leaves, 8–16 in. long, 6–8 in. across, composed of alternate crowded corymbs 3–4 in. long, 2 in. across; lower pedicels 1 in. long solitary in axils of small lanceolate bracts ·2 in. long, grey-pubescent as are the branches and main rachis. *Calyx* 5-partite to base, segments distinctly unequal, ovate-obtuse, greenish-yellow, downy externally, the larger ·35 in. the smaller ·2 in. long. *Petals* 5 suborbicular, ·75 in. long, ·6 in. wide, except the upper obcordate ·6 in. long, ·5 in. wide, all rather pale uniform-yellow. *Stamens* 7 (the 3 upper reduced to staminodes) the 3 lower with much larger anthers and longer filaments than the 2 lateral pairs. *Pod* nearly straight, flat, thin, slightly swollen opposite the seeds, sutures faintly thickened, valves thickly coriaceous, sparsely puberulous, 6–9 in. long, ·5 in. wide, with a distinct stalk ·5 in. long. *Seeds* biseriate 20–30, oval, ·3 in. long, ·25 in. across, very thin, testa dark-brown, shining. Bak. in Flor. Brit. Ind. II, 264. *C florida* Vahl. Symb. III, 57; DC. Prodr. II, 499; W. & A. Prodr. 288; Bedd. Fl. Sylv. t. 179; Miq. Flor. Ind. Bat. I, 98. *C. sumatrana* Roxb. Hort. Beng. 31; DC. Prodr. II, 506; Wall. Cat. 5305. *Senna sumatrana* Roxb. Flor. Ind. II, 347.

Perak; near Ulu Selangor, *Kunstler* 8668! Blanja, *Wray* 147! Malacca; Brisu, *Holmberg* 869! Pahang; Pulo Rumpit, *Ridley* 2648! Distrib. India, Indo-China, Malay Archipelago.

Mr. Wray gives the local name of this in Perak as *Pako Nennong* and notes that the wood is strong and tough. Mr. Holmberg gives the name in Malacca as *Judl.*

§ 4. Chamæcrista DC. *Sepals* narrow; stamens 5 or 10 all perfect equal, or with the uppermost one smaller than the others and sometimes replaced by a staminode. *Pod* dehiscent small strap-shaped, flat, the seeds compressed parallel with the more or less oblique valves.

13. Cassia mimosoides Linn. Sp. Pl. 379. A low diffuse perennial, suberect or spreading, simple or much branched, glabrous or pubescent, sometimes suffrutescent 2–3 feet high; stem terete. *Leaves* 3–4 in. long, equally pinnate; leaflets 40–60 pairs, linear with a distinct oblique mucro, ·1–·15 in. long, glabrous on both surfaces, rachis puberulous with a small sessile gland on the petiole below the lowest pair of leaflets, stipules finely subulate, straight, ·2 in. long. *Flowers* axillary, solitary or 2–3 together, pedicels unequal, ultimately 1 in. long, bracteolate above the middle; buds pointed narrow. *Calyx* 5-partite to base, segments unequal linear-lanceolate to oblong-acute, ·25–·3 in. long. *Petals* 5 subequal, elliptic or orbicular, shortly clawed, obtuse, ·35 in. long. *Stamens* 10 perfect, alternately longer and shorter. *Pod* 2 in. long, ·2 in. across, linear, flattish. *Seeds* 20–25, obliquely rhomboid, compressed, testa dark-brown, shining. DC. Prodr. II, 503;

Miq. Flor. Ind. Bat. I, 101; Bak in Flor. Brit. Ind. II, 266. *C. augustissima* Lamk. Encyc. Meth. I, 650; DC. Prodr. II, 505; W. & A. Prodr. 292. *C. sensitiva* Roxb. Hort. Beng. 32. *C. tenella* Roxb. Hort. Beng. 31. *Senna sensitiva* Roxb. Flor. Ind. II, 353. *S. tenella* Roxb. Flor. Ind. II, 354.

PROV. WELLESLEY; Tasek Selangor, *Ridley* 6995! PENANG; Government Hill, *Curtis* 2507! DISTRIB. Throughout South-Eastern Asia.

14. CASSIA LESCHENAULTIANA DC. Mem. Soc. Hist. Nat. Gen. II, 2, 132. A suberect perennial, rather softly pubescent, 2–3 feet high, stems terete. *Leaves* equally pinnate 1–2 in. long, leaflets 16–24 pairs, narrowly oblong with a distinct oblique mucro and 4–6 strong very oblique secondary nerves, glabrous or puberulous, ·4–·6 in. long, ·1–·15 in. across; rachis pubescent, with a large sessile gland on the petiole below the lowest pair of leaflets, stipules lanceolate straight ·35 in. long. *Flowers* axillary, solitary or 2–3 together, pedicels unequal, ultimately ·25–·35 in. long, bracteolate not far above the base, buds pointed. *Calyx* 5-partite to base, segments unequal linear-lanceolate to oblong-acute, ·35 in. long. *Petals* 5 subequal, elliptic or orbicular, shortly clawed, obtuse, ·4–·6 in. long. *Stamens* 10 or 9 or 7 (all perfect or with the uppermost, or the three uppermost, reduced to staminodes), the 2–3 lowest often rather larger than the lateral ones. *Pod* 1–1·5 in. long, ·2 in. across, linear, flattish. *Seeds* 8–16, obliquely rhomboid, compressed, testa brown shining. DC. Prodr. II, 504. *C. Wallichiana* DC. Prodr. II, 505; W. & A. Prodr. 292. *C. mimosoides* VAR. *Wallichiana* Bak. in Flor. Brit. Ind. II, 266.

PENANG; Government Hill, *Curtis* 829! SINGAPORE; *Hullett* 663! DISTRIB. India; Himalayas; Indo-China.

This is reduced to *C. mimosoides* by Mr. Baker but it seems better in the meantime to keep the two plants apart. They are certainly, as Mr. Baker indicates, very closely related, but they do not much resemble each other and are not easily confounded.

45. KOOMPASSIA Maingay.

Very tall erect trees. *Leaves* odd-pinnate with alternate leaflets. *Flowers* copious small, obscure, in ample terminal panicles; bracts small deciduous. *Calyx*-tube very short conical, or none; sepals 5, lanceolate, subequal, very slightly imbricated. *Petals* 5 subequal, their margins not meeting. *Stamens* 5, filaments short or very short, anthers equal basifixed, dehiscing by two apical pores. *Ovary* sessile, subglobose or slightly elongated, 1-ovuled; style short acute, stigma small, terminal. *Pod* oblong, compressed, winged throughout its circumference, narrowed and somewhat twisted at the base, indehiscent. *Seed* solitary situated

near the middle of the pod; compressed, exalbuminous; cotyledons leafy, radicle short straight. Species 4, Malayan.

Leaflets green beneath; panicles rusty-pubescent; petals exceeding sepals and stamens; anthers short broad; ovary subglobose, rusty-pubescent	1. *K. malaccensis.*
Leaflets glaucescent beneath, much smaller; panicles grey, puberulous; petals much shorter than sepals and stamens; anthers long narrow; ovary compressed, very nearly glabrous	2. *K. parvifolia.*

1. Koompassia malaccensis Maingay ex Benth. in Hook. Icon. Pl. XII, 58. t. 1164. A tree 80–100 feet high, with stem 3–4 feet in diameter; branches closely rusty-pubescent at length glabrescent. *Leaves* alternate odd-pinnate, 5–8 in. long, rachis rusty-pubescent; leaflets 7–9 alternate, ovate-lanceolate or oblong, acuminate, apex obtuse slightly emarginate, base rounded, 2–3 in. long, ·8–1·25 in. wide, coriaceous, dark-green glabrous and shining above, rather paler, dull and sparsely adpressed rusty-puberulous beneath; lateral nerves 10–12 pairs, faintly visible above, distinct beneath and connected by a fine reticulate secondary venation; petiolules rusty-pubescent ·25 in. long. *Panicles* terminal and extending into the axils of the uppermost leaves 5 in. long, 3–4 in. across; branches 2 in. long, pedicels ·2 in. long; all parts densely rusty-pubescent. *Calyx*-tube obsolete; sepals 5 slightly imbricate ovate-acute, ·12 in. long, densely rusty externally. *Petals* 5, oblong, obtuse, white, ·15 in. long, slightly exceeding the sepals, two and a half times as long as stamens. *Stamens* 5, filaments very short glabrous; anthers slightly incurved twice as long as broad, widely triangular. *Ovary* subglobose, densely rusty-pubescent, 1-ovuled; style short. *Pod* oblong, compressed, 4–5 in. long, 1·25–1·5 in. wide, reticulately wide-veined opposite the solitary seed. *Seed* 1·5 in. long, ·65 in. wide, cotyledons foliaceous; cordately 5-nerved at base, nerves conspicuous. Taubert in Engl. Natürlich. Pflanzenfam. III, 3. 156.

Perak; Larut, *Kunstler* 7692! Thaipeng, *Wray* 2388! near Blangie, *Scortechini* 1712! Malacca; Merliman, Selandar, Sungei Udang, etc.; *Maingay* 557 (*fide* Bentham); 604! *Derry* 51! *Holmberg* 880! *Goodenough* 1416! Singapore; Selitan, etc.; *Ridley* 4567! 6403! *Cantley* (*fide* Taubert). Penang; T. Bahang, *Curtis* 432! Dindings; Lumot, *Curtis!* Distrib. Sumatra (River Rawas, *Forbes!*).

This is the fine tree which the Malays know as *Kumpass*. Another species from Borneo (*K. Beccariana* Taubert,—founded on Beccari n. 2690) is evidently closely related; there are no specimens of the species at Calcutta. The description and drawing of the anthers in the original account of the genus are somewhat inaccurate.

2. Koompassia parvifolia Prain. A tree 80–100 feet high, branchlets glabrous or only puberulous at the tips. *Leaves* alternate odd-

pinnate, 3–4 in. long, rachis grey-silky; leaflets 9–11 alternate, elliptic-lanceolate, apex obtuse slightly emarginate, base widely cuneate, 1–1·25 in. long, ·25–·35 in. wide, chartaceous, medium-green, glabrous and shining above, glaucescent and sparsely silky-pubescent beneath; lateral nerves 4–5 pairs, quite invisible above and very faint beneath; petiolules grey-silky, ·2 in. long. *Panicles* terminal, 5 in. long, 2·5–3 in. across, branches 1·5 in. long, pedicels ·15 in. long slightly thickened under the calyx; all parts closely grey-silky. *Calyx*-tube short conical; sepals 5 slightly imbricate, ovate-lanceolate, margins of the inner slightly narrower, recurved, all ·15 in. long and silky-puberulous externally. *Petals* 5, elliptic, white, one-third as long as sepals, half as long as stamens. *Stamens* 5, filaments very short glabrous; anthers distinctly incurved, four to five times as long as broad, narrow-lanceolate. *Ovary* compressed glabrous except for a few hairs at the base, 1-ovuled; style short. *Pod* not seen.

Perak; Goping, *Scortechini* 1996!

This fine tree is known to the Malays as *Tualang;* its timber is largely used for building purposes. In this respect it resembles the preceding species as well as another famous timber-tree from Borneo the *Tapan* (*Koompassia excelsa* Taub. =*Abauria excelsa* Beccari).

From Signor Beccari's description of *Tapan* it is evidently a tree of much more gigantic proportions than the *Tualang*. Its foliage is probably similar for its leaflets are described as being of about the same size; the number of leaflets to a leaf Beccari does not state. But the flowers are very different for in *Tapan* the petals are hardly shorter than the sepals and are about the same length as the stamens, while the anthers are shorter than the filaments; in *Tualang* the petals are very small and the anthers are exceedingly long as compared with the filaments.

46. Dialium Linn.

Erect unarmed trees. *Leaves* odd-pinnate with more or less distinctly alternate leaflets. *Flowers* copious small obscure in ample terminal panicles. *Calyx*-tube very short; free segments lanceolate or ovate lanceolate, subequal, much imbricated, deciduous. *Petals* 0 (in all Malayan species). *Stamens* 2, erect, included; anthers attached near the base, dehiscence longitudinal. *Ovary* sessile, 2-ovuled; style filiform stigma terminal. *Pod* firm, dry, indehiscent, oblong, 1-seeded; endocarp pulpy. *Seed* albuminous, embryo foliaceous, radicle straight. Species about 15, cosmopolitan in the tropics, chiefly however in S.-E. Asia.

Leaves quite glabrous on both surfaces:—

Pods large, (firm), 1·5 in. long, strongly umbonate at apex ... ... 1. *D. Kunstleri.*

Pods smaller, not exceeding 1 in. in length, obtuse or only faintly apiculate :—
Pods fragile not velvety ; leaflets thinly coriaceous :—
Pedicels as long as calyx, panicles laxly spreading 2. *D. patens.*
Pedicels shorter than calyx, panicles erect :—
Leaflets lanceolate alternate ; seeds subquadrate longitudinally striate ... ... 3. *D. indum.*
Leaflets elliptic opposite ; seeds orbicular reticulate ... ... 4. *D. laurinum.*
Pods firm, velvety ; leaflets rigidly coriaceous ... 5. *D. Maingayi.*

Leaves more or less pubescent beneath :—
Leaflets large, 5–7 :—
Leaflets opposite or nearly so, very faintly puberulous beneath ; sepals pubescent within ... ... 6. *D. ambiguum.*
Leaflets conspicuously alternate, thickly covered beneath with golden-brown pubescence ; sepals pubescent within ... ... 7. *D. platysepalum.*
Leaflets small, 9–15 :—
Leaflets 9–11, conspicuously alternate, thickly covered beneath with golden-brown pubescence ; sepals glabrous within ... ... 8. *D. Wallichii.*
Leaflets 13–15, opposite, rusty tomentose beneath ; sepals puberulous within ... ... 9. *D. Kingii.*

1. Dialium Kunstleri Prain. A tree 100–130 feet high with spreading branches, stem 2–3 feet thick ; branchlets slender, pale, rugose glabrous. *Leaves* alternate, odd-pinnate, 5–6 in. long ; leaflets 5, rarely 3, alternate or subopposite, ovate-lanceolate, narrowly acuminate, apex entire, base cuneate, 4–5 in. long, 1·25–1·5 in. wide, coriaceous, rather dark-green shining above, dull and pale green beneath, glabrous on both surfaces ; lateral nerves ascending 5–6 pairs hardly visible above, faint beneath and with there a very faint reticulate intermediate secondary venation ; petiolules stout, very short, ·1 in. long, glabrous. *Panicles* terminal and axillary 4 in. long, 3 in. wide ; branches 2 in. long, glabrous, pedicels (in fruit) ·2 in. long. *Calyx* and *stamens* not seen. *Pod* subspherical, hardly compressed, obliquely prominently umbonate at the tip, firm, 1·5 in. long, 1·35 in. across ; glabrous, very faintly verrucose, black. *Seed* solitary subrotund, smooth, dark-brown, dull, ·6 in. long, ·5 in. wide, ·2 in. thick.

Perak ; Goping, 500–800 feet, *Kunstler* 4415 !

This very fine species, easily distinguished from all the others by its much larger pods with very pronounced umbonate apex, has been but once reported and then, unfortunately, without flowers. It is perhaps most nearly related to *D. indum* from which, however, besides differing as to fruits it is also distinguished by its thicker and fewer leaflets. No native name has been given for the species.

2. Dialium patens Bak. in Flor. Brit. Ind. II, 270. A tree 60–80 feet high with a rather slender stem 10–20 in. thick; branchlets slender smooth pale-brown glabrous. *Leaves* alternate, odd-pinnate, 5–6 in. long; leaflets 3–5, opposite or subopposite, oblong to elliptic, rather abruptly cuspidately narrowed to an obtuse entire apex, base rounded, 3–5 in. long, 1·5–2·25 in. wide, subcoriaceous, bright-green and shining above, paler and dull beneath, glabrous on both surfaces; lateral nerves 8–10 pairs spreading, fine but distinct on both surfaces as is the reticulate intermediate secondary venation; petiolules stout, glabrous, ·25 in. long. *Panicles* terminal and axillary, 6–8 in. long, 4–5 in. wide, rachis and branches slender and flexuous, glabrous; pedicels glabrous spreading or cernuous, ·2–·25 in. long. *Calyx* ·15 in. long, ovoid-oblong in bud, tube obsolete, segments 5, white and almost petaloid, subequal, much imbricated, ovate-oblong obtuse, finely grey-pubescent on both surfaces, the two upper segments sometimes faintly connate. *Petals* 0. *Stamens* 2, filaments short slender, connective puberulous, anthers oblong basifixed. *Ovary* silky, narrowly-ovate, sessile, tapering upwards to the slender incurved style; ovules 2. *Pod* ovoid, slightly compressed, apex not apiculate, fragile, black, thinly grey-pubescent, ·5 in. long ·35 in. across, ·3 in. thick. *Seed* solitary, nearly regularly oblong in shape with rounded angles, ·3 in. long, ·25 in. across, ·15 in. thick, dark-maroon in colour, only slightly shining, neither striate nor reticulate.

Perak; Larut, at low elevations, *Kunstler* 5551! 5577! Malacca; *Griffith* 1846 (K. D.)! *Maingay* 537! Distrib. Borneo.

"*Maingay* 537" forms, with "*Griffith* 1846," the basis of this species. The description here given of pod and seed is drawn up entirely from an example of "*Maingay* 537." The discrepancy between the description in the *F. B. I.* and the actual fruit of the species the writer is unable to explain.

3. Dialium indum Linn. Mantiss. 24. A tree 60–70 feet high with spreading branches; branchlets slender, rugose, grey-puberulous. *Leaves* alternate, odd-pinnate, 6–8 in. long; leaflets 5–9, alternate or subopposite ovate-oblong to ovate-lanceolate, narrowly acuminate apex entire, base cuneate, 3–4 in. long, 1–1·5 in. wide, chartaceous, dark-green slightly glossy above, dull and rather paler beneath, glabrous on both surfaces; lateral nerves 8–10 pairs, faint above more pronounced beneath and with there a distinct reticulate intermediate secondary venation; petiolules glabrous ·2 in. long. *Panicles* terminal and axillary, 4 in. long, 3 in. wide; branches from ·25–2 in. long, faintly silky-puberulous as are the pedicels ·1 in. long, usually in clusters of 3, with caducous basal bracts. *Calyx* ·15 in. long, obtuse-oblong in bud, tube obsolete, segments 5 subequal much imbricate ovate-oblong obtuse, grey-puberulous on both surfaces. *Petals* 0. *Stamens* 2, opposite the two

upper calyx segments, filaments very short slender, anthers large oblong, basifixed, dehiscing longitudinally. *Ovary* silky, ovate, sessile, tapering upwards somewhat abruptly into a slender incurved style; ovules 2. *Pod* suborbicular, ·9 in. wide, slightly compressed, shortly apiculate, fragile, finely puberulous with minute silky hairs but not velvety. *Seed* solitary, obovate-quadrate, brown, finely longitudinally striate, shining, ·5 in. long, ·4 in. wide, ·15 in. thick. Linn. Mantiss. 511; Benn. Pl. Jav. Rar. 136, t. 30; Miq. Flor. Ind. Bat. I, 79; Koord. & Val. Bijdr. II, 20. *D. javanicum* Burm. Fl. Ind. 12. *Carandje* Bontius, Hist. Ind. Or. 93; Rumph. Herb. Amboin. II, 93, footnote. *Tamarindus monococcus minor, etc.* Plunk. Mantiss. 177; Amalth. 198, t. 144, f. 4.

Pahang; Pijaie, Pahang river, *Ridley* 2607! Penang; Ayer Etam, *Curtis!*

This is the *Kranji* of the Malays in Java according to Bontius, Rumphius, Miquel and Koorders. Mr. Ridley's specimens have no native name and as there is no indication that they are from a planted tree it may be reasonably supposed that the species is indigenous in Pahang. The specimens sent by Mr. Curtis are noted as being from "Ayer Etam in Miller's compound;" this remark, taken in conjunction with the fact that two native names "*Kranji borong* or *Kranji padie*" are given as alternatives, seems to point to the species being an introduced one in Penang. The name *Kranji borong* is sometimes applied in Malacca to the quite dissimilar species *D. platysepalum*.

The fruits are eaten for the sake of the pulp that forms the endocarp of the pod. In the *Indian Forester* for October 1896, it is stated that *Kranji* is one of the valuable timbers of the Straits Settlements. The scientific name cited in the notice is *D. indicum*; there is no species of that name. Perhaps the present species is intended; there is however nothing to show whether the tree referred to be this or some of the other species of *Dialium*.

4. Dialium laurinum Bak. in Flor. Brit. Ind. II, 269. A large tree with slender rugose dark-brown rusty-puberulous branchlets. *Leaves* alternate, odd-pinnate, 7–8 in. long; leaflets 7, rarely 5, subopposite, elliptic rather suddenly narrowed to a broad subobtuse or emarginate apex, base broadly rounded, 4–5 in. long, 1·75–2 in. wide, rigidly coriaceous, dark-green on both surfaces, glossy above, dull beneath, glabrous on both sides, secondary nerves 8–9 pairs oblique but not curved, faint above, rather prominent beneath and with there a distinct reticulate intermediate secondary venation; petiolules stout, glabrous, ·3–·4 in. long. *Panicles* terminal and axillary, 4 in. long, 3 in. wide, branches from ·5 to 2 in. long, rusty-pubescent, pedicels ·1 in. long, usually in clusters of 3, silky. *Calyx* ·15 in. long, ovoid-oblong in bud, tube subobsolete, segments 5 subequal much imbricate, oblong-lanceolate, densely grey-velvety on both surfaces. *Petals* 0. *Stamens* 2 opposite the upper calyx-segments, filaments very short, slender; anthers oblong.

Ovary silky, ovate, subsessile, style slender incurved, ovules 2. *Pod* almost orbicular, 1 in. across not apiculate, black, thinly coated with short grey-pubescence, the thin epicarp extremely fragile. *Seed* solitary, almost exactly orbicular, ·5 in. across, ·2 in. thick, reddish-brown, shining and smooth with fine rather wide-meshed reticulations on the surface. Ridley, Trans Linn. Soc. n. s. III, 294.

Malacca; Ayer Panas, etc.; *Maingay* 539 (K.D.)! *Goodenough* 1321! Singapore; Krangi, *Ridley* 6437! Pahang; Pigang, near Pekan, *Ridley*.

A very distinct species, easily recognised by its almost orbicular seed. Mr. Goodenough notes that this is known in Malacca as *Krangi papan*; he however quotes the same name as applied to a form of *D. platysepalum*. There are no Pahang specimens at Calcutta; the locality is cited from Mr. Ridley's paper on the Pahang flora.

5. Dialium Maingayi Bak. in Flor. Brit. Ind. II, 269. A large tree with spreading branches; branchlets slender lenticelled dark-brown, glabrous. *Leaves* alternate odd-pinnate, 4–5 in. long; leaflets 9, rarely 7, subopposite elliptic-oblong narrowed cuspidately to an obtuse or subacute entire apex, base rounded, 2–2·5 in. long, ·75–1 in. wide, coriaceous, very dark-green shining above, dull and paler green beneath, glabrous on both surfaces; lateral nerves 4–5 pairs not visible above, faint and not raised beneath, scarcely more conspicuous than the very faint intermediate reticulate secondary venation; petiolules slender ·2 in. long, glabrous. *Panicles* terminal, 4–5 in. long, 3 in. wide, branches 2 in. long, erecto-patent rusty-puberulous; pedicels ·15 in. long, 2–3 together, rusty-puberulous. *Calyx* ·25 in. long, ovoid in bud, tube very short campanulate, segments 5, or occasionally only 4, much imbricate, broadly ovate-obtuse, shortly brown-velvety silky on both surfaces. *Petals* 0. *Stamens* 2 opposite the two upper calyx-segments, filaments thick nearly as long as the anther, the connective beset with short brown hairs. *Ovary* black-velvety, ovate, shortly stipitate, style incurved glabrous; ovules 2. *Pod* widely obovoid, apex not apiculate, firm, ·9 in. long, ·8 in. wide, hardly at all compressed, densely persistently deep-olive velvety. *Seed* solitary, obovate-quadrate, finely longitudinally striate, shining, ·45 in. long, ·35 in. wide, ·15 in. thick.

Perak; Goping, *Scortichini* 2052! Upper Perak, 1000 feet, *Wray* 3407! 3767! Penang; Tulloh Bahang, *Curtis* 440! 3031! Malacca; Selandan, *Goodenough* 1533! Singapore; *Maingay* 538 K. D. (Herb. Propr. 1398 A.)!

The seeds of this species are hardly distinguishable except in colour from those of *D. indum*, the fruits and the foliage are however extremely different. Curtis gives *Krangi* as the native name of this species in Penang; in Malacca the tree is said by Goodenough to bear the alternative names *Kranji ambot* and *Kranji*

s'Kellat. The latter epithet is however also applied in Malacca to a form of the very different species *D. platysepalum.* No native name is cited with the Perak specimens or with the Singapore ones.

6. Dialium ambiguum Prain. A tree 40–50 feet high, stem 5–8 in. in diam.; branchlets very verrucosely lenticelled, glabrous, blackish. *Leaves* alternate, odd-pinnate, 8–9 in. long; leaflets 7, opposite or rarely subopposite, oblong, rather abruptly shortly caudate-acuminate apex obtuse entire, base rounded, 4–5 in. long 1·5–1·75 in. wide, very rigidly coriaceous, bright-green, glossy and glabrous above, dull and faintly puberulous under the lens beneath; leaf-rachis glabrous; lateral nerves 9–11 pairs, fine, only visible beneath, forming distinct intra-marginal loops and with a fine intermediate reticulate secondary venation; petiolules glabrous ·2 in. long. *Panicles* terminal and axillary, deltoid, slightly spreading, 5–8 in. long, 4–8 in. wide, branches 2–4 in. long very sparsely puberulous with grey-silky hairs as is the main rachis; pedicels usually in clusters of 3, ·15 in. long. *Calyx* ·15 in. long, ovoid in bud, tube obsolete, segments 5, subequal, much imbricate, broadly triangular subacute, reflexed after flower opens; densely brown-velvety on both surfaces. *Petals* 0. *Stamens* 2, opposite the two upper calyx-segments; filaments thick and fleshy one-third as long as anther. *Ovary* light green-silky, ovate, quite sessile, tapering gradually into the glabrous style; ovules 2. *Pod* and seed unknown.

Perak; Goping, 500–800 feet, *Kunstler* 6142! Malacca; Bukit Sadanen, *Derry* 510 (partly; only the specimens termed "*Kranji*")!

This tree is evidently very closely allied to *D. platysepalum* and may ultimately prove to be but a form of that variable species; if so, however, it is an exceedingly distinct variety, readily recognised owing to the differences in its ovary, in its pubescence, and in the arrangement of its leaflets. No native name is given for the Perak specimens; those from Malacca that appear to belong to the same species are simply termed *Kranji.*

7. Dialium platysepalum Bak. in Flor. Brit. Ind. II, 270. A tree 40–50 feet high; branchlets brown, closely-puberulous, sparsely lenticelled. *Leaves* alternate, odd-pinnate, 5–9 in. long; leaflets 5–7, usually conspicuously alternate, or rarely subopposite, elliptic or oblong to ovate-lanceolate, rather abruptly shortly caudate-acuminate apex obtuse entire, base rounded or cuneate, 3–5 in. long, 1–2 in. wide, very rigidly coriaceous, dark-green glossy and glabrous above, densely shortly yellowish-brown silky beneath; leaf-rachis finely puberulous; lateral nerves 9–11 pairs, fine, only visible beneath, forming distinct intra-marginal loops and with a fine intermediate secondary reticulate venation; petiolules puberulous ·25 in. long. *Panicles* terminal and axillary, deltoid, close or slightly spreading, 5–8 in. long, 4–7 in. wide, branches 2–3 in. long, erecto-patent, finely brown-silky as is the main-

rachis; pedicels usually in clusters of 3, ·15 in. long. *Calyx* ·2 in. long, ovoid in bud, tube rather distinct campanulate, segments 5, subequal, much imbricate, broadly triangular-obtuse, coriaceous, reflexed after flower opens, densely brown-velvety on both surfaces. *Petals* 0. *Stamens* 2, opposite the two upper calyx-segments; filaments thick and fleshy one-third to one-half as long as anther. *Ovary* black-velvety, ovate, shortly stipitate, gradually tapering upwards into the puberulous incurved style; ovules 2. *Pod* obovoid or orbicular, apex not apiculate, firm, spherical or slightly compressed, 1 in. long, ·6–·8 in. across, ·5–·7 in. thick; persistently brown-velvety. *Seed* solitary, orbicular, widely oblong or subrhomboid, pale-brown in fresh, darker in old specimens, finely longitudinally striate, ·45 in. long, ·35 in. wide, ·2 in. thick.

VAR. *typica*; leaves usually ovate-lanceolate, cuneate less often rounded at the base; filaments half as long as anthers; pods orbicular very little compressed. *D. platysepalum* VAR. *typica* Bak. *loc. cit.*

PERAK; Larut, *Wray* 4019! MALACCA; *Griffith* 1847! *Maingay* 536! Sungei Udang, *Holmberg* 821! Bukit Sadanen, *Derry* 510 (partly; only the specimens termed "*Sepan*")! Merliman, *Derry* 89! Ayer Panas, *Goodenough* 1693! JOHORE; Machap, *Goodenough* 2000!

VAR. *papan;* leaves elliptic, rounded rarely cuneate at the base; filaments only one-third as long as anthers; pods orbicular very distinctly compressed.

MALACCA; Ayer Panas, *Holmberg* 814! *Derry* 1225! *Goodenough* 1553!

VAR. *burong;* leaves oblong, rounded at base; pods clavately obovoid.

MALACCA; Selandan, *Holmberg* 855!

The tree here described as VAR. *typica* is also the typical variety of *D. platysepalum* as described by Mr. Baker. For reasons given under that plant, the present writer has found it necessary to treat Mr. Baker's VAR. *Wallichii* as a distinct species.

No native name is given for the specimens of *D. platysepalum* collected by Griffith, Maingay, and Wray. Holmberg gives its Malay name as merely '*Koran*'; Derry for his n. 510 collected in 1890 (which, by the way, is quite different from his n. 510 collected in 1892) gives the name *Sepan*. For his n. 89 however Derry gives the name *Krangi s' Kellat;* the same name is used by Goodenough for his n. 1693. As explained under that species, Goodenough also uses this name, with the name *Krangi ambot* as an alternative one, for *D. Maingayi;* and it is true that though the flowers of *D. Maingayi* are quite different from those of *D. platysepalum*, their fruits are exceedingly alike and fruiting specimens of the two are only to be easily distinguished by the absence of pubescence from the leaves of *D. Maingayi*, the presence of a close golden-brown pubescence on the under-surface of those of *D. platysepalum*. Goodenough gives no native name for the Johore examples, which are quite like those from Perak and Malacca.

Whether the other two "varieties" here described are really separable as such, or whether, perhaps, they may not even prove to be distinct species, it is not, from the material at the writer's disposal, at present possible to decide. But field-botanists in the Peninsula should be able to settle the point satisfactorily for themselves.

Var. *papan*, so named because each of the three gatherings has been noted as bearing the Malay name *Kranji papan*, differs from the type only in the characters noted. Its facies, owing to its broadly elliptic leaves and its conspicuously compressed pods, is somewhat distinct, and it is rather noteworthy that all three gatherings have received the same native name, a name too that has been applied to no other form.

Var. *burong*, so named because it has been said by Holmberg to be termed *Kranji burong* by the Malays, has a still more distinctive facies owing to its pods being clavate, and because the pubescence on the under surface of its leaves is of a darker, somewhat brownish tint. Its leaflets too are in shape exactly like those of *D. ambiguum*. Still it does not seem possible to treat it as representing the fruit of *D. ambiguum* because in that tree the leaflets are almost exactly opposite and are very faintly puberulous beneath, in this they are conspicuously alternate and densely pubescent beneath. Its flowers have not been sent. The name *Kranji burong*, it should be noted, is used in Penang as an alternative one with *Kranji padie*, for *D. indum*.

8. Dialium Wallichii Prain. A tree, branchlets brown, closely pubescent, slightly rugose, not lenticelled. *Leaves* alternate 7–8 in. long; leaflets 9–11, very conspicuously alternate, oblong-lanceolate, acuminate, apex acute, base cuneate, 2–2·25 in. long, ·6–·8 in. wide, coriaceous, bright-green glabrous above, densely shortly yellowish-brown-silky beneath; leaf-rachis softly pubescent; lateral nerves about 15 pairs, only visible beneath and there hardly more distinct than the faint intermediate secondary venation; petiolules pubescent ·1 in. long. *Panicles* terminal and axillary, 6–8 in. long, 3–4 in. wide, branches 2–3 in. long, ascending, rather flexuous, softly pubescent as is the main rachis; pedicels ·1 in. long. *Calyx* ·2 in. long, ovoid in bud, tube distinct, segments 5, subequal, much imbricate, broadly triangular-obtuse, thinly coriaceous, reflexed after flower opens, densely greenish-velvety outside, inside white, glabrous. *Petals* 0. *Stamens* 2, opposite upper calyx-segments; filaments very thick less than one-fourth the length of anther, connective uniformly softly pubescent. *Ovary* brown-silky, distinctly stipitate, tapering into the slender, incurved, puberulous style; ovules 2. *Pod* obovoid 1 in. long, ·75 in across, purplish-velvety. *Seed* solitary, subquadrate, indented near the micropyle; ·4 in. long, ·3 in. across, ·15 in. thick, finely longitudinally striate. *D. platysepalum* var. *Wallichii* Bak. in Flor. Brit. Ind. II, 270. *Connaracea* Wall. Cat. 8534.

Malacca; *Mainyay* 540! Singapore; *Wallich* 8534! *Ridley!*

This very distinct species agrees with *D. platysepalum*, of which Mr. Baker has

made it a variety, in having the same golden-brown pubescence on the under surface of its leaflets. But the smaller size of these leaflets; the shortness of the petiolules; the great difference in sepals, glabrous within in *D. Wallichii*, velvety within in *D. platysepalum*; and the equally marked differences in the fruit and the seed have led the present writer to treat it as a species apart.

9. Dialium Kingii Prain. A tree with spreading branches 100–150 feet high, stem 3–4 ft. in diameter; branchlets brown closely pubescent, slightly rugose, not lenticelled. *Leaves* alternate 8–9 in. long; leaflets 13–15, opposite except the terminal one, oblong-lanceolate, apex abruptly cuneate or rounded with an obtuse or retuse tip, base cuneate or rounded, 2–2·5 in. long, ·6–·8 in. wide, very rigidly coriaceous, deep-green glabrous and shining above, rusty-pubescent beneath, leaf-rachis glabrous; lateral nerves about 10 pairs rather distinct, secondary intermediate venation faint; petiolules glabrous ·1 in. long. *Panicles* terminal and axillary, deltoid, 6–8 in. long, 8–10 in. across, branches 3–4 in., erecto-patent, densely dark-brown velvety as is the main rachis; pedicels usually in clusters of 3, ·25 in. long. *Calyx* ·25 in. long, ovoid in bud, tube obsolete, segments 5, subequal, much imbricate, broadly ovate-obtuse, reflexed after flower opens; externally densely brown-velvety, inside waxy-white closely pubescent. *Petals* 0. *Stamens* 2 opposite upper calyx-segments, filaments very thick and fleshy, one-third as long as the bright-yellow anther; connective uniformly softly pubescent. *Ovary* densely brown-velvety, sessile, tapering abruptly into the incurved puberulous style; ovules 2. *Pod* irregularly spherical, ·9 in. long, ·75 in. across, velvety-black. *Seed* solitary, subquadrate, warm-brown, faintly longitudinally striate, ·4 in. long, ·5 in. wide, ·2 in. thick.

Perak; Goping district, in hilly localities from 300–1000 feet, *Kunstler* 4627! 8187!

No Malay name has been sent for this tree which is one of the most distinct and is perhaps the finest of the Peninsular species of *Dialium*. Its nearest ally is evidently *D. Wallichii* from which however its opposite leaflets, rusty-pubescent beneath, and its larger flowers at once distinguished it.

47. Bauhinia Linn.

Unarmed erect trees, or climbers with circinate tendrils. *Leaves* simple usually more or less deeply cleft from the tip, rarely entire or fully divided into two leaflets. *Flowers* usually showy sometimes small, in copious simple or panicled often corymbose racemes. *Calyx*-tube with a disc produced to the top, sometimes long and cylindric, sometimes short and turbinate or campanulate, limb entire and spathaceous or cleft into 2 or 5 teeth, very rarely campanulate truncate. *Petals* 5 subequal usually with a distinct claw. *Stamens* 10, or reduced to 5

or 3 or 1, if fewer than 10 with or without sterile filaments; filaments free filiform; anthers versatile dehiscing longitudinally. *Ovary* stalked, many-ovuled; style long or short, stigma small or large and peltate, subterminal or oblique. *Pod* linear or oblong, flat, continuous within, dehiscent or indehiscent. *Seeds* albuminous, funiculus usually broadly triangular. Species 150, spread throughout the tropics.

Fertile stamens 10, (flowers large showy):—

Leaflets distinct; calyx with a produced tube and a 5-cleft limb (§ LYSIPHYLLUM); a very extensive cirrhose climber ... ... 1. *B. diphylla.*

Leaflets connate; calyx with a short tube and a spathaceous limb (§ PAULETIA); shrubs:—

Lobes of leaves rounded; flowers yellow the upper petal with a central purple blotch; pod puberulous, not ribbed along upper suture ... ... 2. *B. tomentosa.*

Lobes of leaves subacute: flowers pure white; pod glabrous ribbed along each side of upper suture ... 3. *B. acuminata.*

Fertile stamens 3:—

Calyx-tube produced (§ PHANERA):—

Buds narrowly clavate, the calyx-tube passing gradually into the limb; tendrils 0; (flowers large showy):—

Erect; leaves glabrous above; calyx-limb spathaceous; pods glabrous ... ... 4. *B. purpurea.*

Climbing; leaves puberulous above; calyx-limb dividing into equal segments; pods pubescent ... 5. *B. mollissima.*

Buds widely clavate, with a rather abrupt transition from tube to limb; tendrils circinate more or less plentiful:—

Buds club-shaped—calyx-tube slightly ampullæformly dilated downwards, limb in bud obovate; anthers much longer than broad; (leaves of two connate leaflets with rounded or subacute apices):—

Petals glabrous except on midrib and claw externally; (flowers long-pedicelled in pyramidal terminal corymbs):—

Stipules persistent; style glabrous ... ... 6. *B. albo-lutea.*

Stipules deciduous; style densely pubescent ... 7. *B. semibifida.*

Petals uniformly densely pubescent externally:—

Petals much longer than calyx-lobes:—

Flowers long-pedicelled in pyramidal lateral and terminal corymbs; leaves pubescent, (stipules large persistent orbicular) ... 8. *B. Hullettii.*

Flowers short-pedicelled in dense terminal corymbs; leaves glabrous:—

Stipules large persistent orbicular ... 9. *B. Griffithiana.*

Stipules small deciduous ... ... 10. *B. ferruginea.*

Petals not longer than calyx-lobes; (leaves pubescent; corymbs terminal dense, flowers very shortly pedicelled) ... ... 11. *B. Ridleyi.*

Buds clove-shaped—calyx-tube cylindric, limb in bud ovate or orbicular; anthers shortly oblong:—
Leaves of two connate leaflets with rounded apices; (calyx-tube considerably longer than limb) ... 12. *B. glauca.*
Leaves entire or divided at the tip (in young plants of some species casually split to the base) into two narrow acute or acuminate lobes:—
Calyx-tube much longer than the limb; (leaves usually entire, less often divided at the tip, flowers in dense terminal corymbs):—
Leaves 5–7-nerved, adpressed-pubescent beneath; calyx rusty-downy; pod pubescent ... 13. *B. cornifolia.*
Leaves 7–9-nerved, glabrous beneath; calyx sparsely puberulous; pod glabrous ... 14. *B. bidentata.*
Calyx-tube not exceeding the limb:—
Inflorescence lax, the lower flowers not at all deciduous; leaves thick firm:—
Flowers in racemes, the lower pedicels not sensibly longer than those above:—
Racemes long, many-fld.; leaves all entire, glabrous beneath ... ... 15. *B. lucida.*
Racemes short, few-fld.; leaves rather deeply bifid, densely pubescent beneath ... 16. *B. Scortechinii.*
Flowers in corymbs, the lower pedicels manifestly longer than those next above:—
Leaves deeply cordate often subpeltate, not much longer than broad, sometimes 2-fid at tip, petiole 1 in. long ... ... 17. *B. Kingii.*
Leaves shallow-cordate, twice as long as broad, all entire, petiole ·5 in. long ... 18. *B. Finlaysoniana.*
Inflorescence dense, most of the lower pedicels deciduous leaving the rachis below as a longish nodose peduncle; leaves thin flexible:—
Leaves entire or rarely slightly emarginate at tip, 5-nerved; calyx glabrous; (pod glabrous) ... ... 19. *B. Wrayi.*
Leaves divided at apex (only a few in region of inflorescence entire), nerves more than 5; calyx-pubescent:—
Leaves as broad as long, nerves 9–11, apical sinus wide deltoid; calyx rusty-pubescent; pod large pubescent ... 20. *B. integrifolia.*
Leaves longer than broad, nerves 7–9, apical sinus narrow; calyx grey-silky; pod small glabrous; *flowers small* ... 21. *B. glabrifolia.*
Calyx-tube very short (§ Lasiobema); (flowers small, in long narrow many-fld. racemes):—
Calyx-limb 5-partite; petals white; pods small glabrous; leaves flexible, divided at apex:—
Pod short, 2-seeded ... ... 22. *B. anguina.*

Pod longer, 3–5-seeded ... ... 23. *B. Curtisii.*
Calyx-limb entire; petals red; pods large densely pubescent (3–5-seeded); leaves rigid, entire ... ... 24. *B. strychnoidea.*

§ 1. Lysiphyllum Benth. Fertile *stamens* 10. *Calyx* with a long tube and 5-cleft limb. *Pod* broad indehiscent. Leaflets distinct.

1. Bauhinia diphylla Ham. in Syme, Embassy 476 c. Ic. (1800). A very extensive glabrous twining species with circinate tendrils, sometimes spreading 200–300 feet or further. *Leaves* cordate at base; leaflets always quite free, each 5–6-nerved, flexible, rounded at both ends, wider below, 3 in. long, 2 in. across, pale-green glabrous on both surfaces; petiole glabrous ·75–1·25 in. long, slightly thickened at both ends. *Flowers* very large, in lax terminal racemes 8–12 in. long, pedicels glabrous ascending 1·5–2 in. long, bracts small ovate squamous; buds 2 in. long fusiform. *Calyx* thickly coriaceous, green, glabrous, limb cut to base into 5 lanceolate equal reflexed segments 1·2 in. long, tube ·8 in. long very slightly infundibuliform. *Petals* lanceolate erect, clawed, equal, as long as calyx-lobes, ·4 in. wide, white, faintly veined. *Stamens* 10, all fertile, equal, anthers linear, filaments as long as petals, glabrous. *Ovary* glabrous very long-stalked, style ·5 in. long, somewhat incurved. *Pod* very large, thin and flat, 10–16 in. long, 3 in. wide, stipe 2 in. long, rather finely transversely veined. *Seeds* 30–40 in a row along the middle of the pod, oval, somewhat compressed, ·5 in. long, ·3 in. across, ·2 in. thick, testa pale-brown shining. Wall. Cat. 5784; Bak. in Flor. Brit. Ind. II, 278. *Bauhinia Buchanani* Desv. Ann. Sc. Nat., ser. I, IX, 430. *Phanera diphylla* Benth. Pl. Jungh. 264.

Malacca; *Griffith* (fide *Baker*). Distrib. Burma; S. India.

This species is extremely plentiful in Burma but has never been sent to Calcutta from Malaya. It is inserted on the authority of Mr. Baker in the *Flora of British India* II, 278.

§ 2. Pauletia Cav. Fertile *stamens* 10. *Calyx* with very short tube and spathaceous limb. *Pod* narrow dehiscent. Erect shrubs with large showy flowers and connate leaflets.

2. Bauhinia tomentosa Linn. Sp. Pl. 375. An erect shrub with downy zig-zag rounded branches. *Leaves* truncate at base, flexible, rather broader than long, 2–2·5 in. wide, 7–9-nerved, cut three-sevenths down into two rounded obtuse or faintly acute lobes, shining glabrous above, closely pubescent beneath; petiole pubescent, slightly grooved above, thickened at both ends, ·5 in. long. *Flowers* in short-peduncled leaf-opposed 2-fld. (rarely 1- or 3-fld.) peduncles ·4–1·2 in. long, pedicels erect ·2 in. long, 2-bracteolate, bracts linear ·25 in. long; buds narrowly ovate-acute, ·7 in. long, the tip very shortly subulately 5-lobed. *Calyx* green, finely closely pubescent, splitting spathaceously to the base of

the ·5 in.-long limb, tube ·2 in. long, distinctly infundibuliform. *Petals* obovate-spathulate, 1·75 in. long, ·8 in. wide, yellow, the upper with a purple central blotch. *Stamens* 10, all fertile, subequal, anthers linear, filaments hirsute in lower half. *Ovary* distinctly stalked, densely tomentose, style ·5–·7 in. long, straight. *Pod* 4–5 in. long, ·5–·7 in. across, compressed, at length dehiscent, when ripe only faintly puberulous, not ribbed along upper suture; stipe ·2–·25 in. long. *Seeds* 10–16, oblong, flattened, ·25 in. long, ·2 in. across, testa dark-brown shining. Roxb. Hort. Beng. 31; DC. Prodr. II, 514; Roxb. Flor. Ind. II, 323; Wall. Cat. 5790 A—E; Bot. Mag. t. 5560; W. & A. Prodr. 295; Miq. Flor. Ind. Bat. I, 75; Bedd. Flor. Sylv. 92; Bak. in Flor. Brit. Ind. II, 275. *B. speciosa* Roxb. in Wall. Cat. 5791 not of Vogel.

Penang; fide *Baker*. Andamans; *King's Collectors!* Distrib. S.-E.-Asia; Trop. Africa.

There are no Malayan specimens at Calcutta; the plant in the Andamans is, if not cultivated, probably introduced.

3. Bauhinia acuminata Linn. Sp. Pl. 376. A small erect shrub with obscurely downy zig-zag angular branches. *Leaves* slightly cordate, flexible, rather longer than broad, 3–6 in. wide, 9–11-nerved, cut one-third down into two triangular subobtuse or acute lobes, shining glabrous above, glaucescent hairy (sometimes at length glabrescent) beneath; petiole puberulous grooved above, thickened at both ends, 1–1·5 in. long. *Flowers* in leaf-opposed few-fld. corymbs, peduncle ·5 in. long, pedicels erect the lowest ·4 in. long, 2-bracteolate, bracts linear or subulate ·15 in. long; buds lanceolate acuminate 1·5 in. long, the tip very shortly subulately 5-lobed. *Calyx* green, glabrous or faintly puberulous, splitting spathaceously to the base of the 1·25 in.-long parallel-veined limb, tube ·25 in. long, very slightly infundibuliform. *Petals* oblong, pure white, glabrous, 1·75 in. long, 1 in. wide. *Stamens* 10, all fertile, subequal, anthers linear, filaments hirsute in lower third. *Ovary* long-stalked glabrous, style ·5 in. long, curved. *Pod* 4–5 in. long, ·6–·7 in. broad, firm, glabrous, compressed, at length dehiscent, strongly ribbed along each side of the upper suture, stipe ·5 in. long. *Seeds* 10–15, ovate, flattened, ·3 in. long, ·2 in. wide. DC. Prodr. II, 513; Roxb. Hort. Beng. 31; Flor. Ind. II, 324; Wall. Cat. 5794; W. & A. Prodr. 295; Miq. Flor. Ind. Bat. I, 74; Bak. in Flor. Brit. Ind. II, 276. *B. candida* Ait. Hort. Kew. II, 49; DC. Prodr. II, 513 not of Roxb. *B. purpurea* Wall. Cat. 5797 (D only) not of Linn.

Andamans; very common, *King's Collectors!* Perak; *Kunstler* 413! 2386! 8283! *Scortechini* 1812! Malacca; *Hervey!* etc. Distrib. China, India, Indo-China, Malay Archipelago.

§ 3. Phanera Lour. Fertile *stamens* usually 3, sometimes 4–5.

Calyx-tube usually more or less produced ; limb 5-cleft or, very rarely, spathaceous. Erect or scandent ; flowers variable in size.

4. Bauhinea purpurea Linn. Sp. Pl. 375. An erect tree 20–30 feet high, with moderately stout glabrescent branches and without tendrils. *Leaves* roundish, base shallowly cordate, apex divided one-third to one-half down, sinus wideish, lobes rounded obtuse or subacute ; rigidly subcoriaceous, 4–6 in. long and broad, medium green, glabrous above, paler and glabrous or faintly puberulous beneath ; nerves 9–11 ; petiole 1·5 in. glabrous ; stipules small membranous, triangular, ·1 in. long, deciduous. *Flowers* in terminal and axillary short-peduncled few-fld. corymbs, 2–4 in. long ; lower pedicels ·25–·5 in. long, puberulous as is the rachis, bracts minute deltoid, deciduous ; buds clavate 1·5 in. long, tapering uniformly from the blunt apex to the base. *Calyx* tawny-downy, limb ·9 in. long, splitting into 2 coriaceous valves slightly divided at the apex into 5 short teeth, tube slightly dilated upwards ·6 in. long. *Petals* 5, oblanceolate acute with long claw, white to purple, 1·75 in. long, ·5 in. wide. *Stamens* 3–4 fertile, anthers linear-oblong, filaments white, as long as the petals. *Ovary* very long-stalked, puberulous, ovules 16–20, style stoutish ·4 in. long, stigma rather large oblique peltate. *Pod* glabrous 8–12 in. long, ·8–1 in. across, tardily dehiscing, valves firm woody flat, rather pointed at both ends, stipe 1 in long. *Seeds* 12–16, compressed, orbicular, ·5 in. in diam. testa brown. Roxb. Hort. Beng. 31 ; Ham. in Trans. Linn. Soc. XIII, 497 ; Wall. Cat. 5797 in part ; Roxb. Flor. Ind. II, 320 ; W. & A. Prodr. 296 ; Bedd. Flor. Sylv. 92 ; Bak. in Flor. Brit. Ind. II, 284. *B. triandra* Roxb. Hort. Beng. 31 ; Wall. Cat. 5799 ; Roxb. Fl. Ind. II, 320. *B. coromandeliana* DC. Prodr. II, 515. *Phanera purpurea* Benth. Pl. Jungh. 262 ; Miq. Flor. Ind. Bat. I, 60.

Singapore ; *Hullett* 218 ! perhaps planted. Distrib. India ; Indo-China ; China.

5. Bauhinia mollissima Wall. Cat. 5782 (1830). A rather slender climber, usually small but sometimes reaching 60–80 feet in length, branches slender persistently rusty-tomentose ; apparently always without tendrils. *Leaves* roundish, base cordate, apex divided one-third down, sinus wide, lobes obtuse ; rigidly subcoriaceous, 4–6 in. long, rarely a little narrower than broad, bright-green ; above persistently puberulous along the nerves, elsewhere densely papillose and velvety to the touch but ultimately not hairy, beneath thinly persistently rusty-pubescent ; nerves 11–13 ; petiole 1·25–1·5 in., rusty-pubescent. *Flowers* in leaf-opposed racemes, peduncle subterete ·5–2·5 in. long, compressed towards tip, densely rusty-tomentose, lower flowers usually deciduous, bracts persistent ovate-acute under ·1 in. long, pubescent externally,

glabrous within; pedicels ·25 in. long, rusty-tomentose, 2-bracteolate near the apex; buds narrowly clavate 2–2·5 in. long, the narrowly fusiform upper part rather shorter than the narrow slightly infundibuliform base. *Calyx* densely tawny- to rusty-tomentose limb splitting into reflexed equal linear-lanceolate lobes 1–1·25 in. long, tube 1–1·25 in. long. *Petals* 5, narrowly oblanceolate, the four lower 2 in. long, ·3 in. wide, reddish-brown with a central yellow streak, the upper 2·25 in. long, ·5 in. wide, bright-red with a central branching yellow line, all narrowed into a long claw and pubescent externally. *Stamens* 3 fertile, anthers linear-oblong, filaments yellowish, uniform, glabrous. *Ovary* densely tawny-pubescent, stalk ·5 in. long, tomentose as is the style ·7 in. long, stigma small peltate; ovules 4–6. *Pod* pubescent, 4 in. long, 1 in. wide, tapering to both ends, stipe ·5 in. long. *Seeds* 1–2, compressed, orbicular, about ·4 in. in diam. *B. elongata* Korth. Nat. Verh. Gesch. 89 t. 24 (1839); Bak. in Flor. Brit. Ind. II, 281. *B. purpurea* Zoll. & Mor. Syst. Verzeichn. 1; Nat. en Geneesk. Arch. III, 69, not of Linn. *Phanera elongata* Benth. Pl. Jungh. 262; Miq. Flor. Ind. Bat. I, 61. *B. Pottsii* G. Don, Gen. Syst. II, 462.

Perak; *Scortechini! Kunstler* 1024! 2461! 5165! Kedah; at Yau, *Ridley* 5206! Penang; *Porter* (Wall. Cat. 5782)! Malacca; *Maingay* 542/2! Distrib. Northwards to Tenasserim; southwards to the Malay Archipelago.

The name given by Korthals being of considerably later date than that employed by Wallich, Dr. Wallich's name is here adopted. Korthals' figure conveys a rather inaccurate idea of the colour of the flower, the true nature of which is given from a full field-note made by Mr. Kunstler.

6. Bauhinia albo-lutea Prain. A slender shrubby climber with slender rusty-pubescent branches, tendrils few circinate glabrous. *Leaves* roundish, base cordate, apex divided one-third down, sinus narrow apiculate, lobes usually subacute; rigidly subcoriaceous, 2·5–4 in. long, often rather broader than long, dark-green; glabrous above, persistently puberulous, rarely closely pubescent, beneath; nerves 11–13; petiole 1·5–2·5 in., sparsely puberulous; stipules oblong-obtuse, ·2 in. long persistent. *Flowers* in few-flowered lax pyramidal terminal racemes, 3–4 in. long, 3 in. across, pedicels rusty-puberulous erecto-patent the lower 1·5–1·75 in. long, bracts lanceolate ·2 in. long, bracteoles subulate ·15 in., deciduous; buds club-shaped, ·9 in. long, the obovoid upper part exceeding the ampullæform base. *Calyx* rusty-puberulous, limb splitting into reflexed lanceolate segments ·5 in. long, ·1 in. wide, tube ·4 in. long, slightly dilated towards base. *Petals* cream-coloured, 5 subequal, oblanceolate subacute distinctly clawed, 1·25 in. long, ·3 in. wide, glabrous within, and glabrous externally except on the claw and

along the lower third of the midrib. *Stamens* 3 fertile, anthers linear-oblong, filaments uniform 1·5 in. long. *Ovary* distinctly stalked, rusty-pubescent, style slender glabrous, ·8 in. long, stigma oblique peltate. *Pod* thin oblong with black glabrous woody valves. *Seeds* 2 (*fide* Miquel). *Bauhinia ferruginea* Kurz Journ. As. Soc. Beng. XLV, 2. 128 (Enum. Pl. Nicobars); loc. cit. 289 (Burm. Flora) not of Roxb. *Phanera albo-lutea* Miq. Flor. Ind. Bat. I, 1079.

Nicobars; Great Nicobar, *Jelinek* 241! Distrib. Indo-China; Sumatra.

It is rather strange that this species should occur in Burma, the Nicobars and Sumatra and not have as yet been gathered in the Malay Peninsula. It is nearer to *B. semibifida* than to *B. ferruginea*, with which Mr. Kurz has placed it, both on account of its long pedicels and because of its almost glabrous petals, but it differs very markedly as regards bracts and stipules as well as in its ovary which has a glabrous style. Its nearest allies are, however, the Indian *B. nervosa* which differs in having pubescent petals, and the Sumatran *B. stipularis* Korth., which differs in having petals with cordate instead of cuneate bases.

7. Bauhinia semibifida Roxb. Hort. Beng. 31. A very strong climber often exceeding 30 feet in length, with stems 4–6 in. thick; branchlets stoutish brightly rusty-silky, tendrils glabrous few, thick, woody, circinate. *Leaves* roundish, base cordate, apex divided one-third to one-half down, sinus narrow apiculate, lobes round or subacute; rigidly subcoriaceous, 2–3 in. long, sometimes a little narrower than broad, light-green and glabrous above, beneath with reddish rather densely rusty nerves, elsewhere sparsely adpressed-rusty silky; nerves 9–11; petiole 1–1·5 in., sparsely rusty-silky, stipules broadly ovate, falcate, ·15 in. long, very deciduous. *Flowers* in pyramidal terminal racemes 4–10 in. long, 3 in. across, pedicels erecto-patent, rusty-pubescent, 1–1·5 in. long, bracts ·2 in. long, lanceolate, deciduous; buds club-shaped ·9–1·2 in. long, the obovoid upper part exceeding the ampullæform base. *Calyx* densely rusty-pubescent, limb splitting into reflexed lanceolate segments ·5–·7 in. long, ·15 in. wide, tube dilated slightly towards base, ·4–·5 in. long. *Petals* 5 subequal, oblanceolate obtuse, shortly clawed, ·8–1 in. long, ·35 in. wide, dull, white, glabrous except on the claw and along the base of the midrib externally where there is a faint rusty pubescence. *Stamens* 3 fertile, anthers linear-oblong, filaments white, uniform, shorter than the petals. *Ovary* distinctly stalked densely rusty-silky, ovules 6–8, style thick silky stout, ·4 in. long; stigma large oblique peltate. *Pod* thin oblong, with black glabrous woody valves, 4 in. long, 1·25 in. wide, stipe ·35 in. long. *Seeds* 4–6, flattened, orbicular, ·5 in. in diam. Wall. Pl. As. Rar. t. 253; Cat. 5783; Roxb. Flor. Ind. II, 330; Wight Ic. t. 263; Bak. in Flor. Brit. Ind. II, 280. *Phanera semibifida* Benth. Pl. Jungh. 263; Miq. Flor.

Ind. Bat. I, 61. *Bauhinia ferruginea* VAR. *excelsa* Bak. in Flor. Brit. Ind. II, 283; not *Phanera excelsa* Bl. *Phanera sumatrana* Miq. Flor. Ind. Bat. I, 1078.

MALACCA; *Griffith* 1868; Mount Ophir, *Lobb!* SINGAPORE; *Lobb! Maingay* 542/3! *Schomburgk* 60! *Hullett* 55! 146! *Kunstler* 1251! *Ridley!* DISTRIB. Sumatra; Borneo.

This is very near indeed to *B. ferruginea*, but is easily distinguished by the pubescence on the outside of the petals being limited to a line on the centre near the base. *Phanera excelsa* Bl., from Borneo, reduced by Korthals to *Bauhinia ferruginea* is a quite distinct species, recently again reported by Hullett (n. 246). The Malacca specimen collected by Griffith which Mr. Baker refers to *B. ferruginea* VAR. *excelsa* is not at Calcutta, but Maingay 542/3 referred at Kew to the same variety is, at Calcutta, exactly the same as typical *B. sumatrana* Miq. and is therefore only a large form of *B. semibifida*. Another Maingayan sheet (n. 542/2, referred also to *B. ferruginea* VAR. *excelsa*) is, at Calcutta, the quite different *B. mollissima* Wall. (*B. elongata* Korth.).

8. BAUHINIA HULLETTII Prain. A strong shrubby climber reaching 20 feet in length, branchlets stoutish pubescent, tendrils few circinate pubescent. *Leaves* roundish, base cordate; apex divided one-third down, sinus narrow apiculate, lobes round; rigidly subcoriaceous, 2·5–4 in. long, rather longer than broad, dark-green sparsely pubescent above, paler and closely adpressed-pubescent beneath; nerves 9–11; petiole 1–1·5 in., densely pubescent; stipules orbicular hirsute foliaceous, ·5 in. in diam., persistent. *Flowers* in lax few-fld. lateral leaf-opposed racemes, 3–6 in. long, 3 in. across, pedicels erecto-patent densely rusty-tomentose, 1·25–1·5 in. long, bracts lanceolate ·25 in. long as are the linear bracteoles ·15 in. long; buds club-shaped, ·7–·9 in. long, the obovoid upper part exceeding the ampullæform base. *Calyx* pubescent, rose-red as are the pedicels, limb splitting into reflexed lanceolate segments ·4–·5 in. long, ·1 in. wide, tube slightly dilated towards base, ·3–·4 in. long. *Petals* rose-pink, 5 subequal, oblanceolate-obtuse, long-clawed, 1·25 in. long, ·4 in. wide, far exserted, glabrous within, very densely tomentose externally. *Stamens* 3 fertile, anthers linear-oblong, filaments uniform pink, 2 in. long. *Ovary* distinctly stalked, densely silky, style thick tomentose stout, 1·2 in. long, stigma large oblique peltate. *Pod* unknown.

PENANG; *Curtis* 784! *J. Scott! Kunstler* 1347! PERAK; *Wray* 177! MALACCA; *Holmberg* 775!

Very near *B. Griffithiana* but differs in having the stipules, though similar, very much smaller; in having the leaves pubescent instead of glabrous; in having long-pedicelled lax-flowered lateral corymbs instead of short-pedicelled dense-flowered terminal ones, and in having the flowers red or pink.

9. BAUHINIA GRIFFITHIANA Prain. A very strong shrubby climber reaching 20 feet in length, branchlets stout glabrous, tendrils few cir-

cinate, glabrous. *Leaves* roundish, base cordate, apex divided one-third down, sinus narrow apiculate, lobes round; rigidly subcoriaceous, 2·5–4 in. long, about as long as broad, dark-green shining above, paler beneath, quite glabrous on both surfaces, nerves 9–11; petiole 1–1·5 in. glabrous; stipules orbicular foliaceous, ·75 in. in diam., persistent. *Flowers* in pyramidal terminal racemes 3·5–6 in. long, 3 in. across, pedicels spreading, rusty-pubescent, ·4 in. long, bracts ovate ·3 in. long, ·25 in. wide, subpersistent as are the two similar subequal bracteoles; buds club-shaped 1 in. long, the broadly obovoid upper part exceeding the ampullæform base. *Calyx* rusty-puberulous, limb splitting into reflexed lanceolate segments ·6 in. long, ·15 in wide, tube slightly dilated towards base ·4 in. long. *Petals* bright-yellow, 5 subequal, oblanceolate obtuse, shortly clawed, 1·25–1·5 in. long, ·4–·5 in. wide, glabrous within, densely tomentose externally. *Stamens* 3 fertile, anthers linear-oblong, filaments red, dilated in the middle, 2 in long. *Ovary* distinctly stalked, densely silky; ovules 6–8; style thick silky, stout, ·6 in. long, stigma large oblique peltate. *Pod* thin, oblong, with black glabrous woody valves, 5 in. long, 1·5 in. wide, stipe ·35 in. long. *Seeds* 4–6, flattened, ovate, ·5 in. long, ·35 in. across. *Bauhinia ferruginea* VAR. *Griffithiana* Bak. in Flor. Brit. Ind. II, 283. *Phanera Griffithiana* Benth. Pl. Jungh. 263; Miq. Flor. Ind. Bat. I, 65.

MALACCA; *Griffith* 1867! *Maingay* 542! *Hervey!* *Derry* 188! *Holmberg* 775! PERAK; *Scortechini* 298! PAHANG; *Ridley* 2606!

This agrees in foliage with *B. ferruginea* with which Mr. Baker has united it, and it has the same pubescence on the outside of the petals. But it differs considerably in flower and very markedly in the nature of its bracts and of its large persistent stipules and Mr. Bentham seems to the writer to have been undoubtedly justified in treating it as specifically distinct. It is in reality more nearly allied to *B. Hullettii* which has however pink flowers and pubescent leaves, and has the long-pedicelled flowers of *B. semibifida* and *B. albo-lutea*, than it is to the species in which Mr. Baker includes it.

10. BAUHINIA FERRUGINEA Roxb. Hort. Beng. 90. A very strong shrubby climber sometimes exceeding 20 feet, branchlets stoutish soon glabrescent, tendrils few circinate glabrous. *Leaves* roundish, base cordate, apex divided one-third down, sinus narrow apiculate, lobes round; rigidly subcoriaceous, 2·5–4 in. long, always about as broad as long, dark-green, shining and glabrous above, paler and glabrous beneath; nerves 9–11; petiole 1–1·5 in., glabrous; stipules broadly ovate, falcate, ·15 in. long, very deciduous. *Flowers* in pyramidal terminal racemes 3·5–6 in. long, 3 in. across, pedicels spreading, rusty-pubescent, ·4 in. long, bracts ·2 in. long, lanceolate, deciduous; buds club-shaped 1 in. long, the broadly obovoid upper part exceeding the ampullæform base. *Calyx* rusty-puberulous, limb splitting into reflexed lanceolate segments ·6 in. long,

·15 in. wide, tube slightly dilated towards base, ·4 in. long. *Petals* pale greenish-yellow, 5 subequal, oblanceolate-obtuse, shortly clawed, 1–1·25 in. long, ·35 in. wide, glabrous within, densely tomentose externally. *Stamens* 3 fertile, anthers linear-oblong, filaments pink, uniform, 2 in. long. *Ovary* distinctly stalked, densely silky; ovules 6–8; style thick, silky, stout, ·6 in. long, stigma large oblique peltate. *Pod* thin, oblong, with black glabrous woody valves, 8 in. long, 2 in. wide, stipe ·5 in. long. *Seeds* 4–6, flattened, broadly ovate, ·5 in. long, ·4 in. across. Wall. Cat. 5776; Roxb. Flor. Ind. II, 331; Bak. in Flor. Brit. Ind. II, 283 excl. both the varieties and the syn. of Korthals and G. Don. *Phanera ferruginea* Benth. Pl. Jungh. 262; Miq. Flor. Ind. Bat. I, 62.

Perak; *Wray* 622! 1258! *Scortechini* 67! *Kunstler* 2508! 3492! 6173! Penang; *Porter* (Wall. Cat. 5776)! *Curtis* 211!

This is very near to *B. semibifida* Roxb. but is at once distingnished by its petals being externally uniformly pubescent.

Bauhinia ferruginea Korth., referred by Mr. Baker to Roxburgh's plant, is an exceedingly distinct species. Korthal's plant is, in fact, the basis of *Phanera excelsa* Miq., which Mr. Baker elsewhere separates (as to citation) as a variety of *B. ferruginea*. The plant described as var. *excelsa* by Mr. Baker is, however, still another species (*B. sumatrana* Miq., which is only a form of *B. semibifida*). *B. Pottsii* G. Don, also referred here by Mr. Baker, has a tomentose pod and therefore cannot possibly be the present species. Don's plant is doubtless *B. mollissima* Wall. which is the only tomentose-fruited species at all nearly related to the present one.

11. Bauhinia Ridleyi Prain. A very strong shrubby climber reaching 20 feet in length, branches stoutish, thinly but persistently rusty-silky, tendrils few circinate persistently silky. *Leaves* roundish, base cordate, apex divided one-third down, sinus narrow apiculate, lobes usually subacute; rigidly subcoriaceous, 2·5–4 in. long, sometimes a little longer than broad, dark-green strigose above, densely adpressed-pubescent beneath; nerves 9–11; petiole ·75–1 in., densely rusty-pubescent; stipules ovate-lanceolate, falcate, ·15 in. long, very deciduous. *Flowers* in densely congested terminal corymbs 2 in. long and broad, pedicels densely silky ·3 in. long, spreading, bracts and bracteoles equal orbicular, persistent, densely tomentose, ·25 in. long; buds club-shaped ·7 in. long, the obovoid upper part exceeding the ampullæform base. *Calyx* densely softly rusty-pubescent, limb splitting into reflexed lanceolate segments ·4 in. long, ·1 in. wide, tube ·3 in. long, slightly dilated towards base. *Petals* pure-white, 5 subequal, oblong-obtuse, hardly clawed, not exserted, glabrous within, densely tomentose externally, ·4–·5 in. long, ·2 in. wide. *Stamens* 3 fertile, anthers crimson, linear-oblong, filaments ·75 in. long, uniform, red. *Ovary* shortly stalked, densely tomentose, style thick, tomentose, stout, ·5 in. long, stigma large oblique peltate. *Pod* unknown.

Perak; *Scortechini* 140! 519! *Kunstler* 1096! Penang; *Ridley! Curtis* 1291! Johore; *King and Hullett!*

Very nearly related to *B. ferruginea*, *B. Hullettii*, *B. Griffithiana*, and like these species with petals densely pubescent outside; it is, however, easily recognised by its dense corymbs and by its short petals, not at all exserted.

12. Bauhinia glauca Wall. Cat. 5785. A spreading climber with glabrous slender branchlets; tendrils numerous circinate rusty-puberulous. *Leaves* cordate at base, bifid to the middle with obtuse lobes and a narrow sinus; firm, thinly coriaceous, rather broader than long, 2–3 in. across, glabrous above, thinly persistently adpressed rusty-pubescent especially on the nerves beneath; nerves 9–11; petiole ·75–1·25 in. long, stipules linear-subulate ·2 in. long. *Flowers* in copious, dense, peduncled or very rarely subsessile, leaf-opposed and terminal corymbs, the peduncles sparsely rusty often 1–2 in. long, lower pedicels ·5–·75 in. long sparsely rusty, bracts and bracteoles linear-subulate, ·15–·2 in. long; buds clove-shaped ·65 in. long, the ovoid head one-half shorter than the ridged cylindric base. *Calyx* glabrous, limb splitting into subequal ovate-acute lobes ·25 in. long, tube ·4 in. long, puberulous within. *Petals* 5 subequal, cream-coloured, oblong very long-clawed, wavy at the margin, ·75 in. long, sparsely pubescent externally. *Stamens* 3 fertile, anthers short-oblong, filaments white uniform glabrous, ·9 in. long, exceeding the petals, declinate. *Ovary* glabrous with a distinct slender stalk and a stoutish style, ·15 in. long, slightly incurved; stigma small; ovules about 20. *Pod* thin glabrous, flat, 6–8 in. long, 1·5–2·5 in. across, stipe ·25–·3 in. long. *Seeds* 15–20 in a line down the centre of the pod, much compressed, oval, ·5 in. long, ·3 in. wide. Bak. in Flor. Brit. Ind. II, 282. *Phanera glauca* Benth. Pl. Jungh. 265; Miq. Flor. Ind. Bat. I, 68, t. 2 A.

Perak; *Scortechini* 219! *Wray* 3332! Penang; *fide* Baker. Distrib. Indo-China; China; Malayan Archipelago.

The pods are like those of *B. diphylla* but smaller and with shorter stipe. Its nearest allies are the Chinese *B. corymbosa* with similar but smaller leaves and with similar flowers but with narrow pods, and the Assam *B. tenuiflora* with similar pods but with less deeply bifid leaves and with a much longer calyx-tube. Mr. Baker has seen a variety from Singapore with smaller leaves (var. *parvifolia*); this has not yet been sent to Calcutta.

13. Bauhinia cornifolia Bak. in Flor. Brit. Ind. II, 278. A very large slender creeper 100–150 feet long, stems 2–3 in. in diam., branches slender, thinly rusty-downy, tendrils few circinate downy. *Leaves* very slightly cordate at base, narrowed gradually to an obtuse or subacute entire or rarely bifid point, half as long again as broad, 2·5–3·5 in. long, 1·5–2·5 in. across, rather rigidly subcoriaceous, dark-green and glabrous above, thinly adpressed brown-silky beneath; 7- (rarely 5-) nerved; petiole 1 in. long, puberulous, slightly thickened at both ends. *Flowers*

in dense terminal corymbs, 4 in long and broad ; pedicels rusty, erecto-patent, the lower 1·75 in. long, bracts very small deciduous ; buds clove-shaped, the cylindric base much longer than the spherical apiculate upper portion. *Calyx* rusty-downy, limb splitting into 5 subequal ovate shortly acuminate lobes ·25 in. long, ·2 in. across ; tube cylindric ·6–·7 in. long. *Petals* 5 subequal, deep orange-yellow at length becoming brick-red, oblanceolate-oblong very shortly clawed, ·8 in. long, ·5 in. wide, externally sparsely rusty-pubescent. *Stamens* 3 fertile, anthers shortly oblong, filaments much shorter than petals. *Ovary* densely rusty-downy, shortly stalked, style ·2 in. long ; stigma large peltate. *Pod* oblong woody, 4 in. long, 2 in. wide, externally finely adpressed rusty-pubescent ; stipe ·15–·2 in. long. *Seeds* about 4, much compressed, dark-brown, 1 in. long, ·7 in. across.

Penang ; *Griffith ; Kurz ! Hullett* 123 ! *Curtis* 488 ! Malacca ; *Maingay* 545 ! Perak ; *Kunstler* 6261 !

Very closely related to *B. bidentata* but differing in having larger flowers, pubescent pods, and leaves slightly downy beneath. The character derived from the leaf-apex, which appeared reliable when Mr. Baker's account of the Indian *Bauhinias* was published 20 years ago, is now proved, by the large suites of specimens sent to Herb. Calcutta during recent years, to fail within the limits of both of these species.

14. Bauhinia bidentata Jack, Malay. Misc. II, 7, 76. A very large strong creeper over 150 feet long, or sometimes, when growing apart, shrubby or even tree-like (*Kunstler*, *Hullett*), branches slender glabrescent, tendrils few circinate quite glabrous. *Leaves* very slightly cordate at base, sometimes truncate, narrowed gradually to an obtuse or sub-acute bifid or entire point, half as long again as broad, 2·5–5 in. long, 1·5–3·5 in. across, rather rigidly subcoriaceous, dark-green shining above, pale beneath, glabrous on both surfaces ; 7–9-nerved ; petiole 1 in. long, glabrous, slightly thickened at both ends. *Flowers* in dense terminal corymbs 3 in. long and broad ; pedicels finely pubescent, erecto-patent, the lower 1·5 in. long, bracts ultimately deciduous, ovate-acute, ·15 in. long ; buds clove-shaped, the cylindric base much longer than the spherical acute but not apiculate upper portion. *Calyx* puberulous, limb splitting into subequal ovate-acute lobes ·3 in. long, ·2 in. across ; tube cylindric striate 1 in. long. *Petals* subequal, deep orange-yellow at length becoming scarlet, oblong, spreading, shortly clawed, ·6 in. long, ·35 in. wide, externally sparsely rusty-pubescent. *Stamens* 3 fertile, anthers shortly oblong, filaments short hirsute. *Ovary* sparsely pubescent, distinctly stalked, style ·2 in. long, stigma large peltate. *Pod* oblong woody, 4·5 in. long, 1·5 in. wide, externally quite glabrous, stipe ·25 in long. *Seeds* 4–5, much compressed, ·5 in. long, ·35 in. wide. Hook. Comp. Bot. Mag. I, 223 ; Wall. Cat. 5778 ; Bak. in Flor. Brit.

Ind. II, 279. *Phanera bidentata* Benth. Pl. Jungh. 263; Miq. Flor. Ind. Bat. I, 64.

Perak; *Scortechini* 93! 248! *Wray* 1628! *Kunstler* 803! 1000! 3130! 3183! 3528! 4797! 6533! Penang; *Porter* (Wall. Cat. 5778)! *Hullett* 181! *Kunstler* 1300! *Curtis* 136! Selangor; *Ridley* 318! Johore; *King!* *Hullett* 833! Distrib. Sumatra (*Forbes!*); Philippines.

Nearest to *B. cornifolia* Bak.

15. Bauhinia lucida Wall Cat. 5779 A. A large creeper more than 100 feet long, with stoutish glabrous branches; tendrils long circinate glabrous. *Leaves* usually distinctly cordate at the base, tapering from below the middle to an ultimately abruptly shortly acuminate point; rather longer than broad, 3–5 in. long, 2–2·5 in. wide, rigidly subcoriaceous, bright-green shining above, glabrous on both surfaces, 5-(rarely 7-) nerved; petiole ·3–·4 in. long, glabrous. *Flowers* in lax long-peduncled copious paniculate racemes, terminal and extending into the axils of the upper leaves, 4–6 in. long, 2 in. across; pedicels rusty-puberulous, erecto-patent, subequal throughout the raceme, rarely exceeding ·75 in. long, bracts lanceolate, deciduous, ·2 in. long, bracteoles 2 subpersistent, subopposite, subulate, ·15 in. long, near base of calyx-tube; bud clove-shaped, the subcylindric base as long as the obovoid blunt upper portion. *Calyx* closely rusty-tomentose, limb splitting into subequal ovate-obtuse lobes ·25 in. long, ·2 in. across; tube subcylindric ·25 in. long. *Petals* subequal, bright-yellow, ovate-oblong, long-clawed, ·8 in. long, ·5 in. across, externally rusty-pubescent. *Stamens* 3 fertile, anthers shortly oblong. *Ovary* glabrous except on sutures near the base, stalk distinct pubescent; style ·15 in. long, glabrous, stigma large peltate. *Pod* narrowly oblong, woody, 3·5 in. long, 1 in. wide, narrowing towards the base, valves glabrous; stipe ·25 in. long, rusty-pubescent. *Seeds* 4–6, irregularly orbicular, compressed, ·4 in. across. *Bauhinia emarginata* Bak. in Flor. Brit. Ind. II, 278 not of Mill. and hardly of Jack. *Phanera lucida* Benth. Pl. Jungh. 262.

Penang; *Porter* (*Wall. Cat.* 5779)! Perak; *Wray* 2127! *Scortechini* 66! 1534! *Kunstler* 3434! 3902! 6659!

Mr. Bentham and Mr. Baker both refer to this species *B. emarginata* Jack, from Sumatra. But Jack's plant has, by the original description, corymbose racemes with long pedicelled flowers and has tomentose ovaries. It is therefore quite clear that it cannot be the same as *B. lucida* Wall. In any case the use of the name '*emarginata*' is to be deprecated, seeing that it was applied to a Mexican species (*B. emarginata* Mill. *Dict.*, ed. VIII, 5) before Jack's name was published.

16. Bauhinia Scortechinii Prain. A large climber with slender branches, glabrous except at the rusty-puberulous tips, tendrils long circinate puberulous. *Leaves* one and a half times as long as broad,

very shallowly cordate or truncate at base, from which they taper gradually to the junction of upper and middle third thence more abruptly to a bifid tip; 3·5–4 in. long, 2–2·5 in. wide, rigidly coriaceous, dark-green and shining above, uniformly densely rusty-tomentose beneath; nerves 9, rarely 7; sinus ·75 in. deep, very narrow; petiole 1·5 in. long, glabrous, thickened at both ends. *Flowers* in lax, few-fld., terminal short racemes under 2 in. long; pedicels and rachis rusty-pubescent, the former erecto-patent, subequal throughout, the lowest not exceeding ·5 in.; bracts lanceolate subpersistent ·15 in. long, bracteoles 2 subpersistent subopposite subulate, ·15 in. long; bud ·5 in. long, clove-shaped, the cylindric base as long as the spherical upper portion. *Calyx* closely rusty-tomentose, limb splitting into subequal ovate lobes; tube cylindric ·25 in. long. *Petals* subequal ovate, externally densely rusty-tomentose (fully opened flowers not seen). *Stamens* 3 sometimes 4 fertile, anthers short oblong, filaments hirsute. *Ovary* rusty-pubescent, stalk and style distinct, the latter glabrous; stigma large peltate *Pod* not seen.

PERAK; *Scortechini* 698!

This species is evidently very closely related to *B. lucida* with which it agrees altogether in inflorescence and largely in shape of leaf. It differs however in having the leaves densely tomentose beneath and in having them all deeply bifid at the tip. The colour of the flower has not been noted by Father Scortechini, but the petals, in the dried state, are exactly like those of the numerous species that are noted as having orange-yellow flowers which redden with age, and are unlike those petals that are noted as white. Owing to the absence of fully opened flowers the dimensions of petals and the lengths of stipe and style cannot be given.

17. BAUHINIA KINGII Prain. A small climber with slender zig-zag glabrous branches, tendrils circinate glabrous, often much thickened. *Leaves* deeply cordate often slightly subpeltate at base, narrowed gradually from the rounded basal lobes to an ultimately shortly acuminate emarginate or often deeply bifid rarely entire apex, rather longer than broad, 3·5–4 in. long, 2·5–3 in. wide, rigidly coriaceous, medium-green, glabrous and shining above, pale and puberulous along the nerves, very sparsely adpressed-pubescent elsewhere beneath; very uniformly 5-nerved, the nerves much branched outwards; petiole 1 in. long, glabrous. *Flowers* in lax, lateral axillary and terminal corymbs, 3 in. long, 2·5 in. broad, sometimes forming large loose leafless or leafy zig-zag panicles 6 in. across and at times 1–1·5 ft. long; pedicels very sparsely puberulous, spreading, the lowest 1·25 in. long; bracts at base ·2 in. long, lanceolate; bracteoles near apex ·1 in. long subulate, both deciduous; bud clove-shaped, ·5 in. long, the narrowly-infundibuliform base as long as the subglobose apiculate upper part. *Calyx* closely rusty-pubescent, limb splitting into subequal ovate, very shortly acuminate lobes ·25 in. long, ·2 in. across; tube narrow-infundibuliform,

·25 in. long, ·15 in. in diam. at apex. *Petals* subequal, bright-red (*Wray*), oblanceolate-obtuse, long-clawed, ·8 in. long, ·25 in. wide, externally rusty-pubescent. *Stamens* 3 fertile, anthers shortly oblong, filaments hirsute. *Ovary* rusty-pubescent along sutures, long-stalked; style long, curved, puberulous, ·25 in. long, stigma large peltate. *Pod* small, quite glabrous; woody, narrowly ovate, tapering to both ends, 2 in. long, ·8 in. across; stipe ·2 in. long, pubescent. *Seeds* 1 or 2, ovate, compressed, ·3 in. long, ·2 in. across.

Perak; *Scortechini* 320! on Gunong Batu Pateh, at 4500 feet, *Wray* 392! Selangor; Bukit Etam, *Kellsall* 2001! Distrib. Borneo?

This is an exceedingly distinct species, more nearly approaching *B. Finlaysoniana* than any of the other Peninsular species, but amply distinct in the shape and colour of its flowers, the smaller size of its pods, the pubescence on its leaves beneath; also in the shape of the leaves and the type of nervation. Beccari n. 835, from Borneo, of which however there are only 2 leaves and one flower at Calcutta, appears to be the same.

18. Bauhinia Finlaysoniana Grah. in Wall. Cat. 5801. A large climber, over 100 feet long, branches slender glabrous, tendrils few circinate glabrous. *Leaves* slightly cordate at base, oblong, narrowed rather suddenly from above the middle to an obtuse or emarginate or acute point; about twice as long as broad, 3–5 in. long, 1·5–2·5 in. across, rigidly coriaceous, medium-green, glabrous on both surfaces, 5-(rarely 3-) nerved; petiole ·3–·4 in. long, glabrous. *Flowers* in rather lax, terminal corymbs 3–4 in. long, 2–3 in. across; pedicels closely rusty-pubescent, erecto-patent, the lowest 1 in. long; bracts lanceolate, ·15 in. long, deciduous; buds clove-shaped, the subcylindric base rather shorter than the ovoid-acute upper portion. *Calyx* densely rusty-tomentose, limb splitting into subequal ovate-acute lobes ·25 in. long, ·2 in. across; tube subcylindric, ·2 in long. *Petals* subequal, creamy-white or pale yellow, orbicular, distinctly clawed, ·6 in. long, ·5 in. across, externally rusty-pubescent. *Stamens* 3 fertile, anthers shortly oblong. *Ovary* densely pubescent along sutures and on the distinct stalk, style short (·15 in.), glabrous, stigma large peltate. *Pod* (not quite ripe) linear-oblong, woody, 2 in. long, ·6 in. wide. *Seeds* 4–6. Bak. in Flor. Brit. Ind II, 278. *Phanera Finlaysoniana* Benth. Pl. Jungh. 262.

Penang; foot of Government hill, *Curtis* 295! Perak; *Scortechini* 247! 1463! *Kunstler* 3589! *Wray* 2300! Distrib Siam (*Finlayson*).

Mr. Bentham describes this as having almost glabrous petals; this is not the case in the Peninsular specimens. Both Mr. Bentham and Dr. Miquel doubt whether it be more than a form of *B. lucida*; it is, however, extremely distinct from that species and is much more nearly related to *B. Kockiana* Korth. (*Verh. Nat. Geschied.* 87, t. 10), which differs mainly in usually having 3-nerved leaves and in always having rather longer pedicels and a much longer calyx-tube. Dr. Finlayson's

specimens are said by Mr. Bentham to be from the Malay Archipelago, by Mr. Baker to be from the Peninsula; we know, however, from Dr. Wallich's correspondence that the majority of Finlayson's specimens, more particularly those without any definite locality, came from Siam.

19. Bauhinia Wrayi Prain. A shrubby creeper 15–30 feet long, with slender glabrous branches and circinate glabrous tendrils. *Leaves* flexible, truncate very rarely cordate at the base, tapering from about the middle to an acute entire, very rarely an obtuse emarginate apex, rather longer than broad, 2–3 in. long, 1·25–1·75 in. across, medium-green, glabrous above, glaucescent glabrous or faintly puberulous only on the nerves beneath; very uniformly 5-nerved; petiole slender, glabrous, ·5–·6 in. long. *Flowers* in dense close-fld. terminal and axillary racemes, 2·5–4 in. long, the lower flowers deciduous except the few that become fertilised, the remaining terminal portion corymbose 2·5 in. long and broad; pedicels very slender, thickening in fruit, 1·35 in. long, sparsely rusty as is the slightly nodose main-rachis, bracts subulate ·2 in. long, very deciduous; bud clove-shaped, only ·2 in. long, the spherical minutely apiculate upper part in diameter equalling the length of the slender cylindric base. *Calyx* glabrous, tube ·15 in. long, limb splitting into 5 spathulate subequal lobes ·15 in. long. *Petals* pale greenish-yellow, or white at length pinkish, broadly oblanceolate, long-clawed, ·6 in. long, ·2 in. across, margins slightly wavy, sparsely pubescent externally. *Stamens* 3 fertile, anthers shortly oblong. *Ovary* small, 3–4 ovuled, distinctly stalked, quite glabrous throughout, style ·15 in. long, stigma small peltate. *Pod* obovate to oblong-obtuse, tapering to base, thin, woody, stipe ·2 in. long, 2–3 in. long, 1 in. across, quite glabrous. *Seeds* 1–2, rarely 3, very much compressed, broadly ovate, ·5 in. long, ·4 in. across, testa dark-brown, dull.

Perak; *Kunstler* 2238! 2466! 4049! 5243! *Scortechini* 1652! *Wray* 1934! 2782! Selangor; *Kunstler* 8758!

Very distinct from any other Peninsular species, and by its inflorescence (in which it most resembles *B. integrifolia* among the *Phaneras*) connecting *Phanera* with *Lasiobema*, its small flowers approaching those of the latter section. It is extremely nearly allied to a Bornean species (represented by *Mottley* n. 376 and *Haviland* n. 95) which differs in having deeply cordate leaves, in having quite glabrous pedicels, and in having the petals, though similarly crenulate, larger and almost glabrous. It is just possible that the Borneo plant may be the lost *B. cordifolia* Roxb.

20. Bauhinia integrifolia Roxb. Hort. Beng. 90. A large climber over 100 feet long, branches slender rusty-puberulous, tendrils circinate rusty. *Leaves* usually deeply cordate, always about as long as broad, mostly 4–6 in. across and with a deltoid apical sinus ·4–·6 in. deep; the leaves in the region of inflorescences usually small 1·25 in. long, 1 in. across, not infrequently entire; the leaves on young root-shoots

or seedlings paler and larger often 8 in. across, much broader than long with an obtuse-angled sinus reaching nearly halfway down and with divergent deltoid lobes 3–4 in. long; thinly subcoriaceous, bright-green, glabrous and shining above, at times brownish underneath especially on the nerves which are sometimes rusty-puberulous; nerves 11, very rarely 9; petiole glabrous cylindric thickened at both ends, usually 1·75–2·25 in. long, upper petioles in inflorescence ·25–·5 in. only; petioles of young shoots and seedlings sometimes exceeding 4 in. *Flowers* in terminal leafy panicles a foot long, the individual racemes dense close-fld., 3–6 in. long, the lower flowers deciduous except the few that are fertilised, the remaining terminal portion corymbose 3 in. long and broad; pedicels very slender, thickening in fruit, 1·5 in. long, spreading, rusty-pubescent as is the nodose main-rachis; bracts very short, ovate-acute, sometimes persisting; bud clove-shaped, ·35 in. long, the cylindric base slightly shorter than the ovate upper part. *Calyx* rusty-pubescent, tube ·15 in. long, limb splitting into 5 subequal ovate-acute lobes ·2 in. long. *Petals* 5 subequal, bright-yellow passing with age to orange and brick-red, broadly obovate, long-clawed, ·7 in. long, ·3 in. wide, margins slightly wavy, very densely rusty-pubescent externally. *Stamens* 3 fertile, anthers shortly oblong. *Ovary* 4–6-ovuled, densely pubescent, shortly stalked, style very long, ·6 in., glabrous, stigma small peltate. *Pod* oblong, flat, woody, 7–8 in. long, 2·5 in. across, externally pubescent, stipe ·15 in. long only. *Seeds* 3–5, very much compressed, broadly ovate, ·9 in. long ·7 in. across, margin deeply notched at micropyle; funicle flat triangular ·5 in. long, ·5 in. broad at base, narrowing obliquely to the hilum. Wall. Cat. 5780; Roxb. Flor. Ind. II, 331; Bak. in. Flor. Brit. Ind. II, 279. *Phanera integrifolia* Benth. Pl. Jungh. 263; Miq. Flor. Ind. Bat. I, 64 *and* Suppl. 286.

Pahang; *Ridley* 1360! 5023! Penang; *Wallich* 5780 B! *Curtis* 300! 500! 501! Prov. Wellesley; *Kunstler* 1603! Perak; *Scortechini* 98! 515! 1174! *Kunstler* 819! 964! 3585! 3947! 4897! 5538! *Wray* 46! Malacca; *Maingay* 541! 544! *Hullett* 89! *Hervey!* *Derry* 6! 76! 484! 1118! *Holmberg* 850! 866! *Goodenough* 1276! 1672! Distrib. Sumatra.

Like *B. Wrayi* this species serves to connect *Phanera* with *Lasiobema*. In Perak, Mr. Wray informs us, the Malay name of this species is *Dadau*; he says that string and rope are made from the inner bark. Dr. Jack, on the other hand limits the name *Dadaub*, in Sumatra, to his *B. emarginata*. In Malacca there appears to be some dubiety as to the Malay name of the species, the following being those noted:—*Akar Katop-Katop* (Derry, 1118; Holmberg, 866; Goodenough, 1276): *Akar tapak kuda merah* (Goodenough, 1672): *Sarau* (Holmberg, 850): *Tanga Sarau* (Derry, 484).

21. Bauhinia glabrifolia Bak. in Flor. Brit. Ind. II, 281. A slender climber 50–80 feet long, stem 1·5 in. in diam., branchlets slender at first grey-silky, tendrils few short, circinate, woody, sparsely silky. *Leaves* truncate or shallowly cordate, very rarely deep-cordate at base, gradually tapering to an acute point, towards apex of twigs entire, lower down cleft at tip, with narrow sinus extending one-sixth to one-fourth down and with narrow acute lobes; the leaves of young plants and root-shorts bifid to the very base; rather longer than broad, 4–6 in. long, 3–4·5 in. wide, light-green, shining, quite glabrous above, when young pubescent on the nerves at length glabrous beneath; nerves 9 more rarely 7, in the quite 2-fid. leaves 3 or 4 to each lobe; petiole 1·25–2 in., glabrous. *Flowers* in terminal panicles, 8 in. long, 4 in. wide, of numerous dense short-peduncled many-flowered corymbs 2 in. long, 1·25 in. wide, pedicels erecto-patent ·35–·5 in. long, loosely grey-silky, bracts at bases of corymb-peduncles 2, stipellar, ovate-acute, ·15 in. long, silky beneath, glabrous above, at base of pedicels solitary, lanceolate, persistent, ·2 in. long, bracteoles about middle of pedicels 2, subopposed, subulate, ·15 in. long; buds clove-shaped, the spherical subapiculate upper part longer than th narrowly cylindric base. *Calyx* rather laxly grey-silky, limb splitting into spreading subequal ovate lobes with inturned tips, ·25 in. long, tube ·15 in. long. *Petals* small white, obovate, clawed, ·3 in. long, densely grey-silky outside. *Stamens* 3 fertile, anthers very shortly oblong, filaments white slender glabrous, ·5 in. long. *Ovary* densely silky especially along sutures, distinctly stalked, style glabrous slender, ·2 in. long, stigma small. *Pod* (young) with silky sutures and glabrous valves; stipe ·25 in. long. *Bauhinia diptera* Blume ex Miq. Anal. Ind. I, 12. *B. piperifolia* Kurz, Journ. As. Soc. Beng. XLV, 2, 288 not of Roxb. *B. anguina* Kurz, Journ. As. Soc. Beng. XLV, 2. 288 not of Roxb. *Phanera diptera* Miq. Flor. Ind. Bat. I, 70.

Perak; *Scortechini* 316! 1512 (spp. with distinct leaflets = *B. diptera* Bl.)! *Kunstler* 4311! 4511! 6170! *Wray* 3960! Penang; *Curtis* 801! 1541! Distrib. Tenasserim; Pegu; Borneo.

This is extremely nearly related to *Bauhinia piperifolia* Roxb. (*Phanera glabrifolia* Benth.) and has, indeed, been united with Roxburgh's species both by Mr. Kurz and by Mr. Baker. It is however very easily distinguished by its stipelliform main-bracts, not present in *B. piperifolia*; its much longer persistent bracts at base of pedicels; its pedicels less than half as long, with a spreading, not adpressed, tomentum; and its densely woolly ovaries, those of *B. piperifolia* being quite glabrous.

The oldest name is *Bauhinia diptera* Bl. but as the term is applicable only to young leafy root-shoots or to seedling plants and is quite inappropriate when used in connection with flowering branches of adult plants, it seems much better to neglect it. When Mr. Baker's name is used, however, it has to be recollected

that it is merely the name which one employs, and that this can be done only because Baker has referred to his *B. glabrifolia* some Tenasserim specimens collected by Helfer that differ specifically from the plant he describes; both the diagnosis and the cited synonyms of the *Flora of British India* must be altogether excluded.

§ 4. Lasiobema Korth. Fertile *stamens* 3. *Calyx* with very short tube and equally 5-partite or entire truncate limb. *Pod* dehiscent or (*B. anguina*) indehiscent. Slender climbers with long narrow racemes of very small flowers.

22. Bauhinia anguina Roxb. Hort. Beng. 31. A woody climber with slender glabrous branchlets and circinate tendrils. *Leaves* ovate, base cordate, apex of upper leaves often entire, of the others very variably shallowly to deeply 2-fid, sometimes on young plants and root-shoots quite divided to the base with more or less divergent and more or less acuminate lobes; membranous, 2·5–5 in. long, 2–3 in. wide, bright-green, shining, glabrous on both surfaces; nerves 5–7; petiole 1 in. long, glabrous. *Flowers* very small in many-fid. racemes arranged in terminal panicles often extending into axils of upper leaves, 6 in. long, as much across, individual racemes 2–4 in. long, ·5 in across, pedicels spreading, equal, ·15 in. long, very slender, faintly puberulous as is the main-rachis, bracts minute linear; buds small spherical, ·07 in. in diam. *Calyx* faintly puberulous, tube campanulate very short, lobes ovate ·07 in. long, spreading. *Petals* oblanceolate, ·12 in. long, puberulous externally, white. *Stamens* 3 fertile, filaments ·1 in. long. *Ovary* distinctly stalked, glabrous, style slender ·1 in. long, stigma minute. *Pod* thin flat oblong, glabrous, indehiscent, 1·5–2 in. long, 1 in. across. *Seeds* oblong, ·6 in. long, ·35 in. wide, only slightly compressed, long diameter in long axis of pod. Cor. Pl. III, t. 285; DC. Prodr. II, 516; Wall. Cat. 5773; Roxb. Flor. Ind. II, 328; W. & A. Prodr. 298; Bak. in Flor. Brit. Ind. II, 284. *B. scandens* Linn. Sp. Pl. I, 374 (as to Rheede's Malabar, not as to Rumphius' Malayan plant.) *Lasiobema anguinum* Korth. ex Miq. Flor. Ind. Bat. I, 71.

Malayan Peninsula; *fide* Baker in *Flora of British India*. Distrib. India; Indo-China; Malay Archipelago.

Mr. Baker notes this as being from the Eastern Peninsula; no specimens have been sent to Calcutta as yet. Dr. Miquel claims it also as a native of the Malay Archipelago; from this region likewise, no specimens have as yet been sent here; all those at Calcutta from the Archipelago belong to *Lasiobema Horsfieldii* Miq. This latter form Mr. Baker has reduced to *B. anguina* and the writer agrees with Baker in believing that the two plants are not specifically separable. At the same time he considers it better to treat *L. Horsfieldii* as varietally distinct, on account of its much smaller pods which are only 1–1·25 in. long, and ·5–·6 in. wide: Dr. Watt too has, in Herb. Calcutta, proposed for the plant the name *B. anguina* var. *Horsfieldii* Watt MSS. The point is here dwelt on because of the possibility that, when *B. anguina* is again collected in the Peninsula, it may prove to be this Sumatra and

Java VAR. *Horsfieldii*, and not the typical, larger fruited Indian variety, that is characteristic of the region.

23. BAUHINIA CURTISII Prain. A woody climber with slender very faintly puberulous branchlets. *Leaves* ovate-oblong, base rounded, apex divided at the tip into two short diverging deltoid lobes, sinus wide rectangular, a few of the smallest uppermost leaves entire at apex; membranous, 2·5–4 in. long, 2–2·5 in. wide, bright-green glabrous on both surfaces; nerves 5–7; petiole 1·25 in. long, glabrous. *Flowers* very small in terminal, simple, many-fld. racemes or panicles that extend into axils of upper leaves, 4 in. long and as much across, individual racemes 3 in. long, 1 in. across, pedicels spreading, equal, ·5 in. long, very slender, faintly puberulous as is the main rachis, bracts minute linear; buds small ovate-acute, ·15 in. long. *Calyx* puberulous externally, tube campanulate very short, lobes ovate-lanceolate spreading, ·15 in. long. *Petals* spathulate, glabrous, ·25 in. long, clawed, white. *Stamens* 3 fertile, filaments ·35 in. long. *Ovary* shortly stalked, glabrous, style slender, ·15 in. long, stigma minute. *Pod* thin flat, black, somewhat flexible, slightly recurved, quite glabrous, 2·5 in. long, ·75 in. wide, stipe ·07 in. long. *Seeds* 3–5, not seen quite ripe.

KEDAH; Langkawi, Trutow, *Curtis* 1682! near the lake, *Curtis* 2619!

Very nearly related to *B. Championii* Benth., from S. China and the Eastern Himalaya, which has similar but rather larger pods. The present species, however, has longer pedicels, smaller buds, shorter calyx-lobes, a shorter stipe to the ovary and pod. The ovary here is also quite glabrous as are the leaves beneath; in *B. Championii* the ovary is somewhat silky, the leaves adpressed pubescent beneath. It is easily distinguished from *B. anguina* by the longer pods and pedicels. Mr. Curtis' specimens have no tendrils.

24. BAUHINIA STRYCHNOIDEA Prain. A slender climber 60–80 feet long with stems only 1 in. in diam., branches slender glabrous, tendrils few very small circinate glabrous. *Leaves* ovate-acute, base cuneate or rarely rounded, apex entire; rigidly subcoriaceous, 3–3·5 in. long, 1·5–2 in. wide, bright-green glabrous, polished above, dull beneath; nerves 5, the outer pair very slender the inner almost as strong as the laterally branching midrib with whose base they are usually more or less confluent; petiole ·75 in., glabrous. *Flowers* small, in many-fld. racemes arranged in terminal panicles extending into axils of upper leaves, 8–12 in. long, 4–6 in. across, individual racemes 6–10 in. long, 2 in. wide, pedicels spreading, equal, ·75 in. long, very slender, glabrous as is the main rachis, bracts minute linear; buds small, obovoid, ·2 in. long, *Calyx* glabrous, tube campanulate very short, limb wide-campanulate ·2 in. long and as much across, the entire margin truncate with 5 minute projections representing calyx tips. *Petals* spathulate, quite glabrous externally,

slightly puberulous within along midrib, the upper rather longer subacute, the others obtuse ·35 in. long, light-red, spreading. *Stamens* 3 fertile, filaments ·3 in. long. *Ovary* very shortly stalked, densely pubescent, style ·2 in. long, stigma large peltate. *Pod* thin flat densely velvety, 3–5 in. long, 2 in. across, valves woody; stipe very short. *Seeds* 3–5, ovate, dark-brown, 1 in. long, ·6 in. across.

PERAK; *Kunstler* 5914! 7054! *Scortechini!* SELANGOR; Kwala Lampar, "top of the cave," *Kelsall* 1971!

A very remarkable species at once distinguished from any of the other Malayan ones by its leaves, which have the nervation of a *Strychnos*; and from all the hitherto known species by its truncate entire calyx. It might on this account be perhaps treated as the type of a new section. As regards fruit it might be placed in the section *Phanera*; as regards its other characters it agrees better with *Lasiobema* in which it is now placed.

48. CYNOMETRA Linn.

Erect unarmed trees. *Leaves* with few coriaceous odd-pinnate leaflets. *Flowers* copious, minute, in axillary corymbs or racemes. *Calyx* with a very short tube and subbasal disc; divisions 4–5, oblong, imbricated. *Petals* 5, oblanceolate, equal, not exserted. *Stamens* 10, or in *C. polyandra* indefinite, filaments erect, free, filiform, exserted; anthers small, oblong, versatile, dehiscing longitudinally. *Ovary* sessile or short-stalked, 2-ovuled; style filiform, stigma capitate. *Pod* turgid, oblique-oblong, with very thick indehiscent, usually rugose, tough, somewhat fleshy valves. *Seed* exalbuminous, central, filling up the cavity. DISTRIB. Species 20, spread everywhere in the tropics.

Stamens 10 (§ *Eucynometra*); leaf-rachis glabrous:—

Flowers on stem and thick branches in racemes with a produced axis; pedicels glabrous; (leaves 1-jugate) ... 1. *C. cauliflora.*

Flowers among the leaves in racemes or corymbs without a produced axis; pedicels puberulous:—

Corymbs laxly umbelliform, bracts small very deciduous; pods rugose; leaves 1–2-jugate ... ... 2. *C. ramiflora.*

[Leaves 1-jugate ... ... SUBSP. *genuina*;

Leaves 2-jugate ... ... SUBSP. *bijuga*;

End-leaflets acute much exceeding basal pair ... ... VAR. *heterophylla*,

End-leaflets obtuse hardly exceeding basal pair ... ... VAR. *mimosoides*.]

Racemes dense subspicate, bracts subpersistent; pod smooth; leaves 3-jugate ... ... 3. *C. inaequalifolia.*

Stamens 40–60 (§ *Pseudocynometra*); leaf-rachis puberulous; (flowers in axillary corymbs; pedicels puberulous) ... 4. *C. polyandra.*

[Pod smooth ... ... VAR. *typica*;

Pod very rugose, leaflets considerably larger ... ... VAR. ? *Kurzii.*]

§ 1. EUCYNOMETRA. Stamens 10.

1. CYNOMETRA CAULIFLORA Linn. Sp. Pl. 382. A shrub or small tree 8–16 feet high. *Leaves* even-pinnate, leaflets 1-jugate with petiole under ·2 in. long or occasionally with one of the leaflets abortive, dimidiate-oblong to subfalcate-oblong, subsessile, 2–3 in. long, ·75–1·5 in. wide, base cuneate, apex acute or subacute slightly notched, subcoriaceous, dark-green, glabrous on both surfaces, slightly shining above, lateral nerves few ascending not very prominent beneath, not visible above. *Flowers* in small elongated sessile racemes, ·5–2 in. long, occasionally reduced to very short 2–3-fld. stalklets or to single flowers, clustered, rarely solitary, on rugose nodes on the stem, the bracts small concave-ovate, persistent, ·05 in. long, glabrous, pedicels ·2 in. long, slender glabrous, with small concave-ovate basal bracteoles, ·05 in. long. *Calyx*-tube very short, lobes 5, lanceolate, white, ·15 in. long. *Petals* linear, ·15 in. long, white or pink. *Stamens* 10, filaments ·2 in. long, slender, glabrous. *Ovary* glabrescent, shortly stipitate, oblique; ovules 2. *Pod* thick and fleshy, oblong to irregularly globose, apiculate, glabrous, 1–2 in. long, edible. DC. Prodr. II, 509; Roxb. Hort. Beng. 32; Wall. Cat. 5816 A, B; W. & A. Prodr. 293; Miq. Flor. Ind. Bat. I, 77; Bak. in Flor. Brit. Ind. II, 268.

MALACCA; *fide* Baker. DISTRIB. Cultivated occasionally in India and in our area; generally in the Malay Archipelago.

2. CYNOMETRA RAMIFLORA Linn. Sp. Pl. 382. A medium-sized, spreading, sea-coast tree, 20–30 feet high. *Leaves* even-pinnate; leaflets 1-jugate with petiole under ·2 in. long, or 2-jugate with rachis 1·25–2 in. long, the lowest pair always slightly, often much, smaller than the terminal, obliquely obovate-oblong to subfalcate-oblong, subsessile, 1–5 in. long, ·25–2·5 in. wide, base obliquely cuneate, apex obtuse or shortly bluntly acuminate, coriaceous, dark-green, glabrous on both surfaces, shining above, lateral nerves numerous, spreading, rather distinct. *Flowers* in small subumbellate corymbs on small branches above the axils of fallen leaves, ·3–·6 in. long, the bracts small ovate, the outer ·15–·2 in. in diam., very deciduous, pedicels ·3–·5 in. long, very slender, finely puberulous, with small lanceolate basal bracteoles. *Calyx*-tube very short, lobes 5, ovate-lanceolate, white, ·12 in. long. *Petals* white, linear-lanceolate, ·15 in. long, much narrower than sepals. *Stamens* 10, filaments slender, ·25 in. long, glabrous; anthers versatile. *Ovary* densely pubescent, subsessile, very oblique; ovules 2. *Pod* fleshy, strongly wrinkled, irregularly oblong or ovoid with a thick terminal fleshy tip, ·5 in. long, ·4 in. broad and nearly as thick. *Seed* oblong, ·4 in. long, ·3

in. wide, ·2 in. thick. Lamk. Encyc. Meth. II, 240; DC. Prodr. II, 509; Bak. in Flor. Brit. Ind. II, 267.

Subsp. *genuina*; leaves 1-jugate, leaflets subfalcate-oblong, shortly bluntly acuminate. *C. ramiflora* Miq. Flor. Ind. Bat. I, 78. *C. ramiflora* var. *a* W. & A. Prodr. 293.—Rumph. Herb. Amboin. I, t. 63; Lamk. Ill. t. 331 f. 2.

Not reported from our area. Distrib. Java, *Horsfield* 146 (erroneously distributed as *C. bijuga*)! Ceram, *Teysmann* 1961 (erroneously distributed as *C. cauliflora*)! Amboina, *Rumphius* (icon.)! *Teysmann* 5528!

Subsp. *bijuga*; leaves 2-jugate. *C. bijuga* Spanoghe, Linnaea XV, 201 (1841), name only.

a. Var. *heterophylla* Thw. Enum. Pl. Zeyl. 97; terminal pair of leaflets acute or shortly acuminate, larger than the basal pair. *C. bijuga* Miq. Flor. Ind. Bat. I, 78. *C. ramiflora* Bedd. Fl. Sylvat. t. 315, not of Linn. *C. polyandra* Miq. Anal. Bot. Ind. I, 11, not of Roxb.

Andamans; Coco Group, rare, *Prain!* S. Andaman coast, very rare, *King! King's Collector!* Perak; Matong, on the coast, *Wray* 2503! Johore; Skudai River, *Hullett and King!* Singapore; Sungei Jurong, *Ridley* 5891! Distrib. Ceylon, (*Walker*)! Sumatra, (*Forbes*)! Java, Timor, Borneo.

β. Var. *mimosoides* Bak. in Flor. Brit. Ind. II, 267; terminal pair of leaflets obtuse, emarginate or retuse, hardly larger than the basal pair; leaflets much smaller than in var. *a*. *C. mimosoides* Wall. Cat. 5817 (1830). *C. ramiflora* var. *β*. W. and A. Prodr. 293. Rheede, Hort. Malab. IV, t. 31; Lamk, Ill. t. 331, f. 1? (seems to show 1-jugate leaflets only).

Andamans; very common in every tidal and beach forest. Distrib. Malabar, *Rheede* (icon.)! Ceylon, *Wallich* (*Cat.* n. 5816 C in part; mixed with cultivated examples of *C. polyandra* from Madras and erroneously distributed as *C. cauliflora*)! Sundribuns; Arracan; Martaban and Tenasserim.

The three plants here included in *C. ramiflora* have been somewhat misunderstood by Linnæus and indeed by most subsequent botanists. That the plant of Rumphius, here treated as subsp. *genuina*, will have to be kept apart from the other two as a distinct species in any careful monograph of the genus seems to admit of little question. Though mentioned in many works as Indian, no one has ever sent Indian specimens to Calcutta; the only authors who have actually seen specimens that were not from the Malay Archipelago are Wight and Arnott, Thwaites, and Trimen; the specimens mentioned by these writers in every case came from Ceylon not from India. No one has ever sent it from the Malay Peninsula.

It is tolerably certain that the two plants which form what is here termed

SUBSP. *bijuga* are not specifically separable, for some examples from the Andamans seem intermediate between the two. There are, however, no specimens that serve to link either of the forms with the 1-jugate SUBSP. *genuina*, and it will always be necessary to keep them apart as distinct—they are certainly very easily distinguishable — varieties.

VAR. *heterophylla* is also said to be Indian; it is, however, only found in Indian gardens, though it does appear to be wild on the coasts of Ceylon. That VAR. *mimosoides* occurs in India seems likely from its having been figured by Rheede, though no one has ever collected it in Malabar again. It is, however, quite common in the Sundribuns at the northern end of the Bay of Bengal and extends from that area down the eastern side of the Bay as far as Tenasserim and the Andamans; it has never been reported from the Malay Peninsula or Archipelago, where VAR. *heterophylla* (*C. bijuga* Miq.) is the representative form. And just as the two forms grow side by side in the beach forests of the Andamans, so they both occur on the coasts of Ceylon, for a plant from Trincomalee issued by Wallich under 5816/C is the same thing as his own *C. mimosoides* from the coasts of Burma. Wight and Arnott, too, say that they also have seen specimens from Ceylon which are the same as Rheede's Malabar plant; there is no doubt that Rheede's plant is Wallich's *C. mimosoides*.

In the event of SUBSP. *bijuga* being treated as a "species" of which *heterophylla* and *mimosoides* are only varieties, it must be noted that the name to be employed, from the point of view of priority, should be Wallich's, which is a decade anterior to Spanoghe's. But the adoption of Wallich's name will afford an excellent example of the disadvantage of the modern craze that insists on a rigid adherence to the laws of priority, Spanoghe's name being so much the more suitable of the two.

3. CYNOMETRA INÆQUALIFOLIA A. Gray, Bot. U. S. Expl. Exped. 473. A lofty tree 150–200 feet high; leafy shoots at first enveloped in imbricating bracts. *Leaves* even-pinnate, rachis glabrous 2–3 in. long; leaflets 3-jugate, elliptic-oblong, base obliquely cuneate, inner side with the lower third to two-thirds of margin straight, narrower than outer with uniformly curved outline, apex subacuminate; rigidly coriaceous, dark-green, glabrous and smooth on both surfaces, shining above, lateral nerves 8–9 pairs very faint and hardly distinguishable from the secondary reticulations; sessile, 2–3 in. long, 1–1·25 in. wide, the lowest the smallest. *Flowers* in subcapitately congested axillary racemes 1–1·5 in. long, 1 in. wide, the closely imbricating bracts hard, striate, scarious, broadly ovate, ·25 in. across, pedicels puberulous, ·25–·3 in. long, with two oblong membranous basal bracteoles ·15 in. long. *Calyx*-tube very short, lobes 5, narrowly obovate, imbricate, ascending, ·2 in. long, white. *Petals* 5, oblanceolate, white, ·2 in. long, a little narrower than sepals. *Stamens* 10, filaments slender, ·4 in. long, glabrous, anthers versatile. *Ovary* densely pubescent, shortly stipitate, very oblique; ovules 2. *Pod* obovoid, thickly woody, obliquely obovoid, 2–2·25 in. long, 1·5 in. wide, ·75 in. thick. *Seed* solitary, irregularly oval-oblong, 1·6 in. long, 1 in. broad, ·5 in. thick. Bak. in Flor. Brit. Ind. II, 267.

Malacca; *Maingay* 589! *Derry* 893! Prov. Wellesley; Tasek Gelugur, *Ridley* 6981! Perak; *Scortechini* 2190! at Goping, *Kunstler* 6022! 6066!

§ 2. Pseudocynometra. Stamens 40–60.

4 Cynometra polyandra Roxb. Hort. Beng. 32. A large tree, the leafy shoots at first enveloped in imbricating bracts, the basal ones scarious ·3 in. in diam., the inner membranous and reaching 2 in. long, 1 in. across. *Leaves* even-pinnate, rachis puberulous 3–7 in. long; leaflets 3-jugate, elliptic-obovate or oblong, base obliquely cuneate, inner side with the lower half of margin straight, narrower than outer with uniformly curved margin, apex subacuminate, subcoriaceous, dark-green above, paler beneath, glabrous and smooth on both surfaces, hardly shining, lateral nerves 7–8 pairs more prominent beneath than the secondary reticulations, sessile, 2–5·5 in. long, 1–2·5 in. across, the lowest the smallest. *Flowers* in sessile axillary corymbs 2 in. long, 1·5 in. wide, the closely imbricating bracts hard striate scarious, broadly ovate, ·3 in. across, soon deciduous, pedicels pubescent, ·6–1 in. long with 2 very deciduous basal bracteoles. *Calyx*-tube very short, lobes 4, narrow-obovate, imbricate, reflexed, ·4 in. long, white. *Petals* 5, lanceolate, ·4 in. long, narrower than sepals, white. *Stamens* 40–60, filaments slender, ·5 in. long, glabrous, anthers versatile. *Ovary* densely pubescent, subsessile, very oblique; ovules 1–2. *Pod* oblique, oblong, woody, 2–2·5 in. long, 1·25–1·5 in. wide, smooth or rugose. *Seed* solitary, irregularly oblong, 1·5 in. long, 1 in. wide, ·5 in. thick.

Var. *typica;* pod smooth. *C. polyandra* Roxb. Hort. Beng. 32; Pl. Coromand. III, t. 286; Flor. Ind. II, 372; DC. Prodr. II, 509; Wall. Cat. 5815; W. & A. Prodr. 294.

Penang and Malacca; *fide* Baker. Distrib. Khasia, Silhet.

Var. ? *Kurzii;* pod very rugose, leaflets rather larger. *C. cauliflora* Wall. Cat. 5816 E.

Penang; *Jack* (Wall. Cat. 5816 E)! *Kurz!* on Govt. Hill, "Apl. 1890" and "May 1893" *Curtis!* Perak; *Scortechini!*

There are no specimens of *C. polyandra* proper from Penang or Malacca in Herb. Calcutta. The specimens of "var. ? *Kurzii,*" which may possibly prove, when fully represented, to be a distinct species, has been obtained in fruit by Kurz alone; all the other specimens are in leaf only; its flowers are, so far, unknown.

49. Tamarindus Linn.

A spineless tree. *Leaves* abruptly pinnate. *Flowers* in racemes. *Calyx*-tube turbinate; disc produced above its base; teeth lanceolate much imbricated, the two lowest connate. *Petals* only the three upper developed, the two lateral ovate, the upper hooded, the two lower

reduced to scales. *Stamens* monadelphous, only 3 developed, the others reduced to mere bristles at the top of the sheath; anthers oblong, versatile, dehiscing longitudinally. *Ovary* many-ovuled, with a stalk adnate to the calyx-tube; style filiform, stigma capitate. *Pod* linear-oblong, many-seeded, with a thin crustaceous epicarp and thick pulpy mesocarp. *Seeds* exalbuminous. One species, now planted everywhere in the tropics.

TAMARINDUS INDICA Linn. Sp. Pl. 34. A large unarmed tree with spreading branches, 40–60 feet high, stem 2–3 feet in diam., the young branchlets at first puberulous, elsewhere quite glabrous. *Leaves* even-pinnate, 2·5–6 in. long, leaflets 10–20 pairs rather close, oblong-obtuse, ·35–1·25 in. long, ·2–·3 in. across, glabrous on both surfaces, medium-green above, paler sometimes glaucescent beneath; coriaceous, subsessile, reticulate-veined; stipules linear, early caducous. *Flowers* in simple or panicled terminal or lateral racemes 2–4 in. long, bracts concave, caducous, ·25–·3 in. long, obovate-elliptic, pedicels articulated under the base of calyx, slender, ·25 in. long, glabrous; bracteoles small with puberulous margins. *Calyx* ·5 in. long, faintly puberulous, tube narrowly turbinate, ·2 in.; limb 4-partite, segments subequal, ·3 in. long, ·2 in. wide, ovate-acute, entire, much imbricated, membranous. *Petals* 3, an upper and two lateral, yellowish with pink stripes, obovate-oblong, subequal, ·4 in. long, slightly exceeding calyx-limb, ·25 in. across, slightly narrowed to a short claw; the two lower petals replaced by small scales. *Stamens* 3 fertile, anterior, connate nearly half their length, alternating with rudimentary bristle-like staminodia; anthers oblong, versatile. *Ovary* stipitate, style rather short equalling the stamens; stigma terminal, obtuse, slightly thickened; ovules 8–10 or more. *Pod* linear-oblong, nearly straight, thickened, subcompressed; 3–8 in. long, 1 in. wide, ·4 in. thick; outer layer of pericarp thin, crustaceous, scurfy; middle layer pulpy, acid, traversed by fibres. *Seeds* 3–10, obovate-elliptic, compressed, ·6 in. long, ·4 in. wide, ·2 in. thick; testa thick shining, sides areolate. DC. Prodr. II, 488; Roxb. Flor. Ind. III, 215; Wall. Cat. 5824; W. & A. Prodr. 285; Miq. Flor. Ind. Bat. I, 82; Bak. in Flor. Brit. Ind. II, 273; Oliver, Flor. Trop. Africa, III, 307. *T. occidentalis* Gaertn. Fruct. II, 310, t. 146; DC. Prodr. II, 488. *T. umbrosa* Salisb. Prodr. 323. *T. officinalis* Hook. Bot. Mag. t. 4563.

ANDAMANS; Great Coco Island, introduced by the sea, *not* planted, *Prain!* KEDAH; "growing wild at the top of limestone hills," *Kunstler* 1728! SELANGOR; "in dense old jungle," *Kunstler* 8613! DISTRIB. Planted throughout the tropics; believed by Oliver to be truly indigenous in Africa.

50. SINDORA Miq.

Unarmed lofty trees. *Leaves* abruptly pinnate; leaflets few rigidly

coriaceous. *Flowers* small, panicled. *Calyx* with a very short tube and basal disc; segments 4, valvate or very slightly imbricated. *Petal* 1, the size and shape of the upper calyx-segment. *Stamens* 10, the upper free and without anther, the others declinate shortly monadelphous, hirsute, unequal, the two nearest the free staminode always fertile, rather larger than the rest which are alternately short and long and may casually have sterile anthers or none; anthers oblong, versatile, dehiscing longitudinally. *Ovary* 2–5-ovuled, short-stalked, pubescent; style long, filiform, circinate, stigma small terminal capitate. *Pod* more or less oblique, broadly rounded-oblong, dehiscent, the valves flat, hard and woody, armed or not all over the face with straight, conical, firm prickles. *Seeds* usually 2, rarely 3–5, with a hard shining testa and resting on the cupshaped apex of a thick obconic arillate funiculus. Species 9; eight Malayan, one Cambodian.

The earliest publication of any species of this genus was in Rumphius, *Herb. Amboin.* II, t. 13. It thus forms, by citation, a part of the genus *Galedupa* Lamk. (*Encyc. Meth.* II, 594 [1786]); it is not, however, covered by the description of *Galedupa indica* given by Lamarck; that description applies only to the *Pongam* of Rheede (*Hort. Malab.* VI, t. 3), now known as *Pongamia glabra* Vent. As this latter name is validly established—Rheede's genus having been published by Adanson as *Pongam*, before it was mistaken by Lamarck for *Galedupa*—it may be one day found necessary to restore Lamarck's name *Galedupa indica* and restrict it to Rumphius' *Caju Galedupa*. In any case *Galedupa* is the generic name first applied to, and therefore, by the modern canons, the one that should be used for what is at once *Sindora* Miq., *Echinocalyx* Benth., and *Grandiera* Lefevre. The writer, be it understood, is of those who consider our modern priority-hunting to be frequently unwise; this consideration will probably be shared by sober-minded students who, after reading what is said here and what has been already said under *Pongamia*, may take the trouble to examine the treatment that adepts in the art are prepared to accord the names now under discussion.

The genus is not a member of the tribe *Cynometreæ* but of the *Amherstieæ*, where it has to be placed close to the genera *Pahudia* Miq. and *Afzelia* Linn. *Pahudia* is in fact almost exactly intermediate between *Sindora* and *Afzelia* since it combines the thinner leaves and the much imbricated sepals of the latter, with almost the pod and exactly the seeds of the former. The stamens in both *Pahudia* and *Sindora* are similarly united in a sheath, but there is the curious difference that the two nearest the fissure are abortive and represented by bristles on the tube in *Pahudia*, whereas in *Sindora* these are fully developed and in some of the species are at times the only fertile stamens present.

Pods armed on the face with strong straight prickles (unknown in *S. velutina*); leaves puberulous or pubescent beneath :—

Pods subequally rounded at base, style and beak at opposite ends of its long axis; rachis of raceme straight with spirally-set bracts and flowers :—

Stipules large foliaceous; calyx-lobes with a few spines outside in their upper third ... ... 1. *S. Wallichiana.*

Stipules inconspicuous; calyx-lobes rather densely spinescent outside in their upper two-thirds ... 2. *S. Echinocalyx.*

Pods obliquely rounded at base, beak projecting laterally at right angles to direction of stalk (unknown in *S. velutina*); rachis of raceme zig-zag with subdistichously-set bracts and flowers:—

Leaflets 3-jugate, puberulous beneath; calyx-lobes slightly spinescent in their upper third outside ... 3. *S. intermedia.*

Leaflets 5–6-jugate, densely pubescent beneath; calyx-lobes not spinescent ... ... 4. *S. velutina.*

Pods unarmed; leaves glabrous beneath; (pod subequally rounded at base, calyx-lobes not spinescent) ... ... 5. *S. coriacea.*

1. SINDORA WALLICHIANA Benth. A large tree with slightly rusty-pubescent branchlets. *Leaves* equally pinnate with puberulous rachis 4–6 in. long, stipules very large foliaceous semi-lunar sub-intrapetiolar, ·6 in. long, acute at apex, rounded auriculate at base, pubescent on both sides; leaflets 3-jugate, oblong, apex round or acute, base round or cuneate, 1·5–3·25 in. long, 1 in. wide, the lowest pair slightly the smallest, very coriaceous, shining glabrous above, dull uniformly pubescent beneath, nerves numerous close horizontal slightly irregular, faint beneath not visible above, petiolules ·2 in. long, puberulous. *Flowers* in axillary and terminal lax panicles 6–8 in. long, 5–6 in. wide, individual racemes 3–4 in. long with straight pubescent rachis, flowers spirally arranged, bracts broadly ovate-obtuse, ·4 in. long, densely pubescent beneath, sparsely puberulous above, pedicels ·35 in. long, with two ovate-lanceolate bracteoles, ·2 in. long, at the apex; buds oblong densely pubescent, ·4 in. long. *Calyx*-tube short, lobes 4, thick, ·25 in. long, densely strigose within, ovate-acute, valvate, sparingly spinescent externally in the upper third. *Petal* 1, as long as the calyx-lobes, inside densely hairy. *Staminal*-sheath and filaments declinate pubescent. *Ovary* very hirsute, style twisted, stigma capitate. *Pod* broadly oblong, subequally rounded at base so that the short stout straight beak projects in the direction of the long axis, 3 in. long, 2 in. across; valves dehiscent, puberulous, woody, uniformly armed on the outside with strong straight conical spines ·15 in. long. *Seeds* usually 2, with arillate funicle. *Sindora Wallichii* Benth. in Hook. Icon. Plant. t. 1018 *not* t. 1017; Bak. in Flor. Brit. Ind. II, 268 in part, excl. syn. *Echinocalyx* Bth. and both VARS. *Guilandina Wallichiana* Grah. in Wall. Cat. 5805. *Galedupa Wallichiana* Prain MSS.

SINGAPORE; *Wallich* 5805! *Kurz! T. Anderson* 41! MALACCA; *Griffith!*

The Griffithian specimens referred to were given by Dr. Griffith to Dr. McClelland; from his collection they passed into the Calcutta Herbarium under Griffith's original name "*Cassia* sp." They were afterwards examined by Dr. T.

Thomson, who referred them to the genus *Schotia* which is much nearer their real position. They are very distinct, by reason of their less spiny calyx-lobes and their large foliaceous stipules, from another Griffithian gathering from Malacca, first issued from Kew as n. 1848 under the name "*Dialium?* sp." and subsequently made by Mr. Bentham the type of his genus *Echinocalyx*. When afterwards referring *Griffith* n. 1848 and *Wallich* n. 5805 to one species, Mr. Bentham, who apparently had only Wallich's specimens at his disposal, did not know that the Singapore plant has large foliaceous stipules.

2. Sindora Echinocalyx Prain. A large tree with glabrescent branchlets. *Leaves* equally pinnate with puberulous rachis 2–3 in. long, stipules small; leaflets 3-jugate oblong, apex round or slightly acute, base round or slightly cuneate, 1·25–2 in. long, ·75–1 in. wide, the lowest pair slightly the smallest, very coriaceous, shining glabrous above, dull minutely puberulous beneath especially on the midrib, nerves numerous close horizontal slightly irregular, faint beneath not visible above, petiolules ·15 in. long, puberulous. *Flowers* in axillary and terminal lax panicles 4–5 in. long, 2·5–3 in. wide, individual racemes 1·25–1·5 in. long, with straight puberulous rachis, flowers spirally disposed, bracts ovate-obtuse ·25 in. long, glabrescent above, puberulous beneath, pedicels ·25 in. long, puberulous, with two oblanceolate bracteoles, ·2 in. long, at the apex; buds oblong, puberulous, ·3 in. long. *Calyx*-tube short, lobes 4 thick, ·2 in. long, pubescent inside, ovate-acute, valvate, rather densely uniformly spinescent externally in the upper two-thirds. *Petal* 1, pubescent internally. *Staminal*-sheath and filaments declinate, hairy. *Ovary* very hirsute, style curved, stigma capitate. *Pod* broadly oblong, subequally rounded at base so that the slender straight beak projects in the direction of the long axis, 2·25 in. long, 1·5 in. across; valves dehiscent, puberulous, thinly woody, uniformly armed on the outside with strong straight conical spines ·15 in. long. *Seeds* 2, funicle arillate. *Sindora Wallichii* Benth. in Hook. Icon. Plant. t. 1017, *not* t. 1018 and *not Guilandina Wallichiana* Grah. *S. Wallichii* var. *ovalifolia* Maingay MSS. *Echinocalyx* Benth. in Benth. & Hook. f. Gen. Pl. 1, 584. *Galedupa Echinocalyx* Prain MSS.

Malacca; *Griffith* 1848! *Maingay* 562/1!

Nearest to *S. Wallichiana* but easily distinguished by its less pubescent leaves, different stipules, and smaller flowers with more spinescent calyx.

3. Sindora intermedia Baker. A large tree, over 100 feet high, with slightly rusty-tomentose branches. *Leaves* equally pinnate, with puberulous rachis 4–6 in. long, stipules small; leaflets 3-jugate, oblong, apex round or slightly acute, base round or slightly cuneate, 1·5–2·5 in. long, 1 in. wide, the lowest pair slightly the smallest, very coriaceous, shining glabrous above, dull minutely puberulous beneath especially on the midrib, nerves numerous close horizontal slightly irregular, not very

conspicuous beneath, not visible above, petiolules ·15 in. long, puberulous. *Flowers* strongly scented, in axillary and terminal dense panicles, 4–6 in. long, 2·5–3 in. wide, individual racemes 2 in. long with suberect zig-zag rusty-tomentose rachis, flowers subdistichous, bracts ovate-acute ·3 in. long, densely puberulous beneath, sparsely so above; pedicels ·35 in. long rusty-tomentose, with two ovate-lanceolate bracteoles, ·2 in. long, at the apex; buds oblong densely pubescent, ·4 in. long. *Calyx*-tube short, lobes 4, thick, ·25 in. long, very densely strigose on the inside, ovate-acute, valvate, sparingly spinescent externally in the upper third. *Petal* 1, reddish, as long as the calyx-lobes, densely hairy. *Staminal*-sheath and filaments declinate, red with rusty hairs; perfect anthers 9. *Ovary* very hirsute, style twisted, stigma capitate. *Pod* wide-oblong, obliquely rounded at base so that the small recurved beak projects laterally at right angles to direction of stalk, 2 in. long, 2·5–3·5 in. across; valves dehiscent, puberulous, woody, uniformly armed on the outside with strong straight conical spines ·2 in. long. *Seeds* usually 2, rarely 3–5, with hard black shining testa, oblong, horizontal, ·5 in. long, ·75 in. across, resting on a basal, arillus-like, thick obconic funiculus about ·75 in. long. *Sindora Wallichii* VAR *intermedia* Bak. in Flor. Brit. Ind. II, 268. *S. Wallichii* Scortechini MSS. not of Benth. *Galedupa intermedia* Prain MSS.

PANGKORE; Gunong Tungal, *Curtis* 1630! *Scortechini* 1064! MALACCA; *Maingay* 562! PERAK; *Scortechini!*

This is at once distinguished by its transverse pods from both of the species placed under *S. Wallichiana* by Mr. Bentham. Mr. Curtis gives the Malay name of this in Pangkor as "*Sapetir*."

Two other species with similarly oblique pods are *S. sumatrana* Miq. and *S. cochinchinensis* Baill.; it is just possible that *S. velutina* Bak. may prove to share the character and to belong to the same group.

4. SINDORA VELUTINA Bak. in Flor. Brit. Ind. II, 269. A large tree with densely tawny-tomentose branches. *Leaves* equally pinnate with sparsely pubescent rachis 5–7 in. long, stipules not seen; leaflets 5–6-jugate, oblong, apex subacute or acute, base round or slightly cuneate, 2·5–3·5 in. long, 1–1·75 in. wide, the lowest pair rather the smallest, very coriaceous, shining glabrous above, dull densely uniformly softly pubescent beneath, nerves numerous close horizontal slightly irregular, very faint beneath, not visible above, petiolules ·1 in., densely pubescent. *Flowers* in axillary and terminal lax racemes 5–7 in. long, 3 in. wide; individual racemes 2 in. long, with zig-zag densely tawny-pubescent spreading rachis, flowers subdistichous, bracts ovate-acute, ·3 in. long, densely tawny-tomentose, pedicels ·15 in. long, densely tomentose as are the two lanceolate bracteoles; buds oblong, densely pubescent, ·4 in. long. *Calyx*-tube short, lobes 4, thick, ·25 in. long, densely hairy

within, ovate-acute, valvate, without spines externally. *Petal* 1, as long as calyx-lobes, densely hairy. *Staminal*-sheath and filaments declinate hairy. *Ovary* very hirsute, oblique; style twisted, stigma capitate. *Pod* not yet known. *Galedupa velutina* Prain MSS.

Malacca; Maingay 607!

Of this very distinct species the only specimens hitherto collected are Maingay's. One of these has been very kindly placed at Dr. King's disposal, for purposes of description, by the Director of the Royal Gardens, Kew. There is no doubt as to its affinity being greatest, as Mr. Baker has already indicated, with *S. intermedia*, and though it is as yet impossible to say if the pod is marked by the presence or absence of spines, it is very probable, from the obliquity of the ovary, that it has a transverse pod like *S. intermedia* and *S. sumatrana*.

5. Sindora coriacea Prain. A large tree with glabrous branches. *Leaves* equally pinnate with glabrous rachis 5–6 in. long, stipules small; leaflets 4-jugate, oblong, apex rounded or subacute, base round or slightly cuneate, 2–3 in. long, 1·25–1·5 in. wide, the lowest pair rather the smallest, very coriaceous, shining glabrous above, dull glabrous beneath, nerves numerous close horizontal slightly irregular, very faint, petiolules ·15 in. glabrous. *Flowers* in axillary and terminal lax panicles 8–10 in. long, 4 in. wide; individual racemes 2 in. long, with straight, thinly rusty-puberulous, spreading rachis; flowers spirally disposed, bracts and bracteoles not seen, pedicels thinly rusty, ·2 in., buds oblong, thinly rusty, ·25 in. long. *Calyx*-tube short, lobes 4, thick, ·2 in. long, very faintly imbricated; spineless externally. *Petal* 1. *Staminal*-sheath and filaments hairy. *Pod* broadly oblong, subequally rounded at base so that the strong slightly recurved beak, ·3 in. long, continues the direction of the stalk, tip subobliquely cuneate, tapering abruptly on the dorsal, slightly rounded on the ventral suture, 3 in. long, 2·25 in. across; valves dehiscent, glabrous, woody, unarmed. *Seeds* 2–3, funicle thick arillate. *Afzelia? coriacea* Bak. in Flor. Brit. Ind. II, 275. *Intsia coriacea* Maingay MSS. *Galedupa coriacea* Prain MSS.

Malacca; Chaban, *Maingay* 566! *Ridley* 2328! Penang; Tulloh Bahang, *Curtis* 430!

This fine tree is said by Mr. Ridley to be the "*Sapetir*" of Malacca; this name, it will be noticed, is used in Pangkor for the nearly allied but quite distinct *S. intermedia*. Mr. Curtis says it is known in Penang as "*Mirbau;*" the "*Mirbau*" of the Mainland, it will be observed, is *Afzelia palembanica*.

Of the specimens referred to, the writer has only seen leaves of Maingay's, and only fruits of Curtis' and of Ridley's gatherings. The description of the flowers is therefore constructed from the characters stated and implied in the brief description of the *Flora of British India*. The number of stamens mentioned by Maingay, still more their monadelphous nature, makes it certain that the plant can be no *Afzelia* and goes to indicate that it is a species of *Sindora*; the fruiting specimens sent by Mr. Curtis and Mr. Ridley show that this is really the case.

The leaflets of this species are exactly like those of *S. sumatrana* but the pods differ in being much larger, and in being neither transversely twisted nor armed. The pods both in shape and in the absence of spines resemble those of *S. Galedupa* (*Galedupa indica* Lamk. Encyc. Meth. II, 594, as to syn. *Caju Galedupa* Rumph. Herb. Amboin. II, 59, t. 13) and only differ in being a good deal larger. The two may indeed ultimately prove to be forms of one species.

51. Afzelia Smith.

Erect unarmed trees. *Leaves* abruptly pinnate, with few pairs of opposite leaflets. *Flowers* in copious terminal panicles. *Calyx* with the disc produced to the top of the elongated tube; sepals 4, much imbricated, slightly unequal. *Petal* only one developed, orbicular with a distinct claw, the others absent or rudimentary. *Stamens* 3 perfect, filaments long, pilose; anthers minute, oblong, opening longitudinally. *Pod* large oblong flattish, sublignose, subindehiscent. *Seeds* exalbuminous. Species 10–12; tropics of Old World.

Leaflets 4, rarely 2:—

Pedicels and calyx glabrous ... ... 1. *A. retusa.*

Pedicels and calyx puberulous ... ... 2. *A. bijuga.*

Leaflets 8, rarely 10 or 6; (pedicels and calyx pubescent) ... 3. *A. palembanica.*

1. Afzelia retusa Kurz, Journ. As. Soc. Beng. XLIII, 2, 73. A small tree 15–20 feet high, stem 6–8 in. in diam. *Leaves* even-pinnate, 3–6 in. long; leaflets 2- (very rarely only 1-) paired, sometimes only subopposite, subcoriaceous, glabrous on both surfaces, oblong, base rounded, apex obtuse, emarginate or retuse, 2–4 in. long, 1·5–2 in. wide, nerves numerous fine spreading reticulate, petiolules distinct, ·15 in. long, glabrous as is the rachis. *Flowers* in numerous terminal simple rarely slightly branched few-flowered glabrous racemes 2·5–3 in. long; pedicels stout glabrous, ·5 in. long, bracteoles ovate-oblong, glabrous, ·2 in. long, very early caducous as are the similar bracts. *Calyx* quite glabrous, tube slightly dilated upwards, ·5 in. long, somewhat exceeding limb with 4 subequal oblong spreading lobes ·35 in. long, ·25 in. wide. *Petal* ·7 in. long, limb ·6 in. wide, ·4 in. deep with rounded waved apex and wide-cuneate entire base, white or pinkish, claw very slender ·3 in. long; pubescent along claw and midrib externally. *Stamens* 3 fertile, filaments 1·25 in., sparsely pubescent, pink. *Ovary* stalked, pubescent on lower suture, soon glabrous, style glabrous slender, 1·5 in. long. *Pod* 5–6 in. long, 2 in. wide, oblong, rigid, curved, coriaceous. *Seeds* orbicular, 1 in. in diam., ·25 in. thick. Bak. in Flor. Brit. Ind. II, 274.

Andamans; very common on all the coasts. Perak; *Wray* 2491! Pangkore; *Scortechini* 975! Malacca; *Griffith* 1855! Singapore; *Ridley* 4675! 6006! Distrib. Gangetic Delta.

Very nearly related to *A. bijuga* and perhaps only a variety of that species.

Mr. Baker attributes to this, just as Mr. Kurz does to *A. bijuga*, the occasional presence of 3 pairs of leaflets; none of the numerous specimens at Calcutta have more than two pairs of leaflets.

2. AFZELIA BIJUGA A. Gray, Bot. Amer. Explor. Exped. 467, t. 51. An erect tree reaching 50 feet in height, 1–1·5 feet in diam. *Leaves* even-pinnate, 3–6 in. long; leaflets 2-(very rarely only 1-) paired sometimes only subopposite, subcoriaceous, glabrous on both surfaces, oblong, base slightly oblique wide-cuneate or rounded, apex obtuse or bluntish acuminate emarginate, 2–4 in. long, 1·5–2 in. wide, nerves numerous fine spreading reticulate, petiolules distinct ·15 in. long, glabrous as is the rachis. *Flowers* in leaf-opposed or terminal corymbose pubescent panicles 6 in. long, 4 in. wide, the individual racemes 1·5–2 in. long; pedicels slender puberulous ·6 in. long, jointed, 2-bracteolate under the calyx, bracteoles oblong puberulous ·1 in. long, bracts oblong ·1 in. long caducous. *Calyx* puberulous, tube cylindric ·3 in. long, rather shorter than limb with 4 subequal oblong spreading lobes ·35 in. long, ·25 in. wide. *Petal* ·6 in. long, limb ·5 in. wide, ·35 in. deep, with rounded waved apex and wide cuneate entire base, white or pink, claw very slender, ·25 in. long; pubescent along claw and midrib externally. *Stamens* 3 fertile, filaments 1·25 in., sparsely pubescent, pink. *Ovary* stalked, pubescent on both sutures, exserted, style glabrous slender, 1·5 in. long. *Pod* 6–8 in. long, 2·5 in. wide, oblong, rigid, thickly coriaceous. *Seeds* orbicular 1 in. across, ·25 in. thick. Bak. in Flor. Brit. Ind. II, 274. *Intsia amboinensis* Thouars Gen. Nov. Madag. 22; DC. Prodr. II, 509; Miq. Flor. Ind. Bat. I, 80, all in part: Miq. Flor. Ind. Bat. Suppl. 288. *Baryxylum rufum* Lour. Fl. Coch. Chin. 266 in part. *Macrolobium bijugum* Colebr. in Trans. Linn. Soc. XII, 359, t. 17. *Outea bijuga* DC. Prodr. II, 511; Wall. Cat. 5823. *Metrosideros amboinensis* Rumph. Herb. Amboin. III, 21 (in part) t. 10. *Jonesia triandra* Roxb. Flor. Ind. II, 220.

ANDAMANS; very common in all the coast forests, *Kurz! Prain! King's Collectors!* NICOBARS; Kamorta, *Kurz!* SINGAPORE; *Wallich* (Cat. n. 5823 B)! *Ridley!* DISTRIB. All coasts from Eastern Polynesia to the Mascarene Islands.

In Mr. Kurz's description of this species occurs the statement that the leaflets may be at times in 3 pairs, and the same variation is indicated in Rumphius' figure quoted above. But the writer finds, as Mr. Baker does, that this species has not more than 4 leaflets. Mr. Kurz's statement is due to his having treated Andamans specimens of *Afzelia palembanica* as representing a form of *A. bijuga*.

The synonym *Intsia amboinensis* only applies to this species in the sense in which it is used by Miquel in his *Suppl.*: there is an authentic example of the Sumatra plant so named by Miquel in the Calcutta Herbarium; it is a specimen of *Afzelia bijuga*. The earlier use of the name must be neglected, since it has been made to cover Rumphius' description. For, while it is clear that that des-

cription includes this sea-coast species, it also includes one, if not more than one, inland species of far greater dimensions than this littoral tree ever attains.

Roxburgh's *Jonesia triandra* is not a *Saraca* but is this species.

3. AFZELIA PALEMBANICA Bak. in Flor. Brit. Ind. II, 275. A tall erect tree 100–150 feet high, stem 2–3 feet in diam. *Leaves* even-pinnate 6–8 in. long; leaflets usually 4- (very rarely only 3-, more often 5-) paired, sometimes only subopposite, subcoriaceous, glabrous on both surfaces, oblong, base slightly oblique, rounded or subcordate, apex obtuse or bluntish-acuminate emarginate, 2–4 in. long, 1·5–2 in. wide, nerves numerous fine spreading reticulate, petiolules distinct ·15 in. long, glabrous as is the rachis. *Flowers* in leaf-opposed or terminal corymbose pubescent panicles of few-flowered racemes, 3·5 in. long, 2·5 in. across, the individual racemes 1 in. long; pedicels slender, pubescent, ·15–·2 in. long, jointed 2-bracteolate under the calyx, bracteoles ovate, pubescent, ·2 in. long, bracts small ovate, ·15 in. long, caducous. *Calyx* downy, tube cylindric ·2 in. long, shorter than limb with 4 subequal oblong spreading lobes ·25 in. long, ·2 in. wide. *Petal* ·35 in. long, limb oblong ·25 in. long, ·2 in. wide, margin uniform, claw ·1 in. long, glabrous. *Stamens* 3 fertile, filaments ·75 in., sparsely pubescent, dark-claret coloured, two sterile filaments at base of petal. *Ovary* stalked, pubescent, exserted; style glabrous, slender, ·75 in. long. *Pod* 10–12 in. long, 3·5 in. wide, oblong, almost woody. *Seeds* wide-oblong, 1·25 in. long, 1 in. wide, ·3 in. thick. *A. bijuga* Kurz, For. Flor. Brit. Burm. I, 412 not of Gray.

ANDAMANS; South Point, *Kurz!* PERAK; *Wray! Kunstler* 4433! 7387! *Scortechini* 1839! MALACCA; *Griffith! Maingay* 565! *Cantley* 1670! *Holmberg* 776! DISTRIB. Siam (*Teysmann!*).

This is, according to Maingay, "the best Malacca timber tree;" according to Scortechini it affords "the best timber in the Peninsula." The Malay name, according to Scortechini, is *Mirbau* in Perak; Holmberg gives this as the Malacca name also. In Penang however, according to Curtis, the name *Mirbau* is used for *Sindora coriacea*.

While this species is *Afzelia palembanica* Bak., it certainly is not *Intsia palembanica* Miq., of which one of the original types is in Herb. Calcutta. That tree, as Miquel says, has ovate-lanceolate leaflets (3 in. long by 1·25 in. wide, tapering to an acute point), it has also large ovate *persistent* bracts, ·3 in. across. It does not seem necessary to alter the name in this place, but in a monograph of *Afzelia* it will be necessary to term the Peninsular species *Afzelia Bakeri*.

Mr. Baker has pointed out incidentally an omission in Mr. Kurz's *Forest Flora of Brit. Burma*: Kurz himself collected this species in the Andamans; strangely no one has met with it there again. He has, however, united it with *A. bijuga* and it is this union that explains Mr. Kurz's double error of attributing to *A. bijuga* pods a foot long and leaves with more than 4 leaflets.

52. Saraca Linn.

Erect trees. *Leaves* abruptly pinnate, leaflets glabrous rigid subcoriaceous or coriaceous, in bud minutely stipellate, stipels very rarely persistent, stipules large intrapetiolar scarious completely united, rarely foliaceous partially free. *Flowers* in dense sessile paniculate rarely simple corymbs on old nodes, or rarely axillary, with subpetaloid coloured persistent or rarely decidous bracts and bracteoles. *Calyx* petaloid, limb 4-cleft lobes imbricate subequal, tube cylindric crowned by a lobed disc. *Corolla* 0. *Stamens* 2–8, exserted, with long filiform filaments and oblong versatile anthers opening longitudinally. *Ovary* many-ovuled, with a stalk attached to and produced beyond the disc, in most of the flowers rudimentary; style long filiform, stigma minute suboblique capitate. *Pod* flat dehiscent, rigidly coriaceous. *Seeds* exalbuminous. Species 16 or more; all South-Eastern Asiatic.

Leaves quite glabrous; stipules small at length scarious quite united along their inner margins; stipels vanishing; flowers yellow, at length becoming reddish, in paniculate corymbs:—

Bracts and bracteoles very deciduous, large where known; (pedicels glabrous):—

Leaflets 7-jugate, petiolules ·4 in. long; calyx-lobes shorter than tube, bracts and bracteoles very large:—

Corymbs subsessile, dense, subsimple; pods over 3 in. broad; (calyx-lobes more than half as long as tube; stamens 4) ... ... 1. *S. thaipingensis.*

Corymbs in lax long-peduncled panicles; pods 2 in. broad:—

Calyx-lobes one-third as long as tube; stamens 4; pod beakless ... ... 2. *S. declinata.*

Calyx-lobes half as long as tube; stamens 7–8; pod beaked ... ... 3. *S. cauliflora.*

Leaflets 2–3-jugate, petiolules ·25 in. long; calyx-lobes as long as tube; (corymbs in lax long-peduncled panicles; pods 1·5 in. broad; bracts and bracteoles unknown; stamens apparently 7) ... ... 4. *S. Kunstleri.*

Bracts and bracteoles persistent, small; (petiolules not exceeding ·2 in.):—

Stamens 7–8; (pedicels glabrous):—

Leaflets 4–6-jugate, coriaceous; bracteoles amplexicaul, ascending ... ... 5. *S. indica.*

Leaflets 1–2-jugate, subcoriaceous; bracteoles not amplexicaul, spreading ... ... 6. *S. bijuga.*

Stamens 3–4:—

Pedicels glabrous; ovary glabrous (leaflets 4–7-jugate) ... ... 7. *S. macroptera.*

Pedicels puberulous; ovary pubescent:—

Leaflets 4–7-jugate, corymbs short ... ... 8. *S. palembanica.*

Leaflets 2–4-jugate, corymbs long ... ... 9. *S. triandra.*

Leaves with rachis, petiolules and nerves beneath pubescent; stipules large foliaceous, united only in lower third; stipels persistent, flowers white in simple corymbs; (stamens 2) ... 10. *S. latistipulata.*

1. Saraca thaipingensis Cantley MSS. in Herb. Kew. A tree 50–80 feet high, with rather slender stem 6–15 in. in diam. *Leaves* with rachis 16–30 in. long; leaflets membranous, strongly veined, 6–8-paired, oblong-lanceolate, apex acuminate, base slightly obliquely wide-cuneate, 12–16 in. long, 4–5 in. wide, secondary nerves about 12 pairs, dark-green, dull and glabrous on both surfaces; petiolules stout ·4 in. long, stipels caducous; stipules coriaceous at length scarious, usually soon deciduous, the two united throughout into a convolute sheath for the subsequent bud, when laid open narrowly oblong, 1 in. long, ·4 in. across, parallel-nerved and emarginate at the apex. *Flowers* in dense simple corymbs from old nodes on thick branches and stems, 3 in. long and 3–4 in. across; peduncles and pedicels glabrous, stout; bracts large oblanceolate-obtuse, lowest 1·5 in. long, ·3 in. wide, tapering from near the apex to the narrow-cuneate base, decreasing upwards; bracteoles 2 oblanceolate, deciduous, ·5 in. long, pedicels below bracteoles ·3 in. long. *Calyx* yellow at length becoming red, tube ·8 in. long, less than twice as long as limb of 4 oblong sepals, ·5 in. long. *Petals* 0. *Stamens* 4 with a rudimentary filament, the filaments slender throughout; anthers nearly twice as long as broad; filaments twice as long as sepals. *Ovary* stalked, puberulous along sutures, elsewhere glabrous, usually rudimentary; style declinate. *Pod* purple when young, shining dark-red when ripe, 15–18 in. long, 3·25 in. wide, linear-oblong, considerably curved, much compressed, stipe under ·25 in. long, apex beakless, straight on lower, rounded on upper suture at the blunt apex, more rounded on upper than on lower suture at the oblique base.

Perak; Thaiping, *Cantley* 36! Tupai, *Wray* 2448! Larut, *Scortechini!* *Kunstler* 2249! 2768! Goping, *Kunstler* 4248! 6088! Malacca; Ulu Chembong, *Derry* 999! Bukit Tampin, *Goodenough* 1875 A!

Mr. Derry gives the local name of this as "*Talan;*" Mr. Goodenough notes it as "*Gapis:*" consult also the note under *S. cauliflora.*

2. Saraca declinata Miq. Flor. Ind. Bat. I, 84. A tree 20–60 feet high with rather slender stem 6–15 in. in diam. *Leaves* with rachis 12–24 in. long; leaflets thinly subcoriaceous, strongly veined, 6–8-paired, oblong-lanceolate, apex acuminate, base slightly obliquely wide-cuneate, 9–12 in. long, 3–4 in. wide, secondary nerves about 12 pairs, dark-green shining above, dull beneath, glabrous on both surfaces; petiolules thick ·4 in. long, stipels caducous; stipules coriaceous at length scarious, usually soon deciduous, the two united throughout into a convolute sheath for the subsequent bud, when laid open ·75 in. long, ·3 in. wide,

parallel-nerved. *Flowers* in panicles of corymbs from leaf axils and from old nodes on branches and stems, 1 foot long, sometimes nearly as broad, individual corymbs 4–6 in. long, peduncles and pedicels glabrous, stout, bracts very large ovate-acuminate, 2 in. long, ·7 in. wide, tapering from the middle to both ends, decreasing upwards : bracteoles 2, elliptic, deciduous, ·5 in. long, pedicels below bracteoles ·5 in. long. *Calyx* bright yellow, tube 1 in. long, cylindric, slender, slightly curved, thrice as long as limb of 4 obovate obtuse-sepals. *Petals* 0. *Stamens* 4 with a rudimentary filament, the filaments slender throughout and inserted in the retiring angles of a 5-lobed disc ; anthers nearly twice as long as broad ; filaments thrice as long as sepals. *Ovary* stalked, puberulous along sutures elsewhere glabrous, most often rudimentary ; style declinate. *Pod* black, 12 in. long, 2·75 in. wide, linear-oblong, quite straight, compressed, stipe under ·25 in. long, base equally cuneate and apex equally acute to the beakless tip. *Jonesia declinata* Jack, Malay. Miscell. II, 7. 74 ; Walp. Rep. I, 844.

Pahang ; Tembeling, *Ridley* 2587 ! Perak ; Kwala Kearing, *Wray* 544 ! *Scortechini* 1747 ! Larut, *Kunstler* 2729 ! 3961 ! 5393 ! Selangor ; Kwala Lampar, *Curtis !* Malacca ; Nyalas, *Goodenough* 1720 ! Distrib. ; Sumatra, Java.

This species is said by Mr. Goodenough to be "*Gapis Kognet*" or "*Talan Kognet,*" the same names as he cites for *S. cauliflora ;* see note under that species.

3. Saraca cauliflora Bak. in Flor. Brit. Ind. II, 272. A tree 20–60 feet high, with rather slender stem 6–15 in. in diam. *Leaves* with rachis 12–16 in. long ; leaflets rigidly subcoriaceous, strongly veined, 5–6-paired, oblong-lanceolate, apex acuminate, base slightly obliquely wide-cuneate, 9–12 in. long, 3–4 in. wide, secondary nerves about 12 pairs, dark-green shining above, dull beneath, glabrous on both surfaces ; petiolules stout ·4 in. long, stipels caducous ; stipules coriaceous at length scarious usually soon deciduous, the two united throughout into a convolute sheath for the subsequent bud, when laid open ·75 in. long, ·3 in. wide, parallel-nerved. *Flowers* in panicles of corymbs from old nodes on branches and stems, 6 in. long and as much across, individual corymbs 3 in. long, peduncles and pedicels glabrous stout ; bracts very large, obovate-acute, deciduous, lowest 2 in. long, ·6 in. wide, tapering from above the middle to a cuneate base, decreasing upwards ; bracteoles 2, lanceolate, deciduous, ·5 in. long, pedicels below bracteoles ·5 in. long. *Calyx* yellow, tube 1 in. long, twice as long as limb of 4 oblong sepals. *Petals* 0. *Stamens* 7–8 with a rudimentary filament and two acute angular projections on the disc ; the filaments alternately slender throughout and widened towards the base ; anthers nearly twice as long as broad ; filaments twice as long as sepals. *Ovary* stalked, puberulous

along sutures elsewhere glabrous, usually rudimentary; style declinate. *Pod* black, 12–15 in. long, 2·25 in. wide, linear-oblong, somewhat curved, compressed, stipe ·3 in. long, base cuneate towards upper suture, apex acute tapering towards lower suture which is prolonged into a stout beak 1 in. long.

Malacca; *Griffith, Maingay, Derry! Goodenough!* Perak; *Scortechini!*

The local name of this species is said by Mr. Goodenough to be "*Gapis Kognet*" or "*Talan Kognet*;" Mr. Derry notes it as "*Bunga Talan?*"

How far the characters are valid that separate this species and *S. thaipingensis* from *S. declinata* is, in the writer's opinion, a very doubtful matter. The chief diagnostic character, in the case of *S. cauliflora*, is the presence of 7 stamens and the writer has accordingly placed in Mr. Baker's species only those specimens where 7 or 8 stamens occur. These however consist of but two gatherings, one from Malacca and one from Perak; for, as it happens, neither Maingay's nor Griffith's specimens that form the original types of the species are represented at Calcutta. The pods described were collected by Goodenough in Malacca and are placed here because they certainly differ from the pods that are known to belong to the tree described as *S. declinata* and from those that belong to *S. thaipingensis*. But young pods of *S. declinata* from Java are rather more like those here supposed to belong to *S. cauliflora* than like those of the Peninsular *S. declinata* and a careful field study of the forms by Malayan botanists is urgently called for. The species which Mr. Cantley has named *S. thaipingensis* has usually been distributed as *S. cauliflora* and it is, as a matter of fact, of the three here described, the one that best accords with Mr. Baker's account of the leaves and of the corymbs of his *S. cauliflora*. But *S. thaipingensis* appears never to have more than 4 stamens and therefore can hardly be Baker's plant. If it can only be shown that the characters to be derived from the stamens and the pods are at all variable it may be possible to reduce both Mr. Baker's and Mr. Cantley's plants to *S. declinata*.

4. Saraca Kunstleri Prain. A tree 20–40 feet high, stem 3–5 in. in diam., branchlets zigzag glabrous. *Leaves* even-pinnate, rachis 5–10 in. long, glabrous; leaflets petiolulate large, 2–3-jugate, diminishing downwards, ovate-acuminate, base cuneate, distal 8–10 in. long, 3·5–4 in. wide, basal if 2 pairs and central if 3 pairs 4–5 in. long, 2·25–2·5 in. wide, basal if 3 pairs 3·5–4 in. long, 2–2·25 in. wide; all chartaceous, dark-green above, rather paler beneath, glabrous on both surfaces, main-nerves ascending, 6–9 pairs, more prominent beneath as is the midrib and the fine secondary reticulation; petiolules ·25 in. long. *Flowers* in terminal long-peduncled paniculate corymbs, the peduncles 8–12 in. long, glabrous as are the branches 1–2 in. long, and the pedicels. *Calyx*-tube and pedicels, especially the latter, very short, together only ·4–·5 in. long; bracts not seen; calyx-lobes ovate-oblong ·2 in. long, glabrous. *Corolla* 0. *Filaments* 7, anthers not seen. *Pod* falcate 4–6 in. long, 1·5 in. wide, glabrous. *Seeds* 3–6, transversely ovate, ·5 in. long, ·7 in. across, ·25 in. thick, testa black, smooth, shining, crustaceous.

Perak; Gunong Batu Pateh, 1500–2000 feet, *Kunstler* 8048 !

A very distinct species, apparently nearest *S. Lobbiana* Bak.; unfortunately good flowers are not yet available for description.

5. Saraca indica Linn. Mant. I, 98. A low wide-spreading tree 20–30 feet high, stem 2 feet thick, branches glabrous. *Leaves* with rachis 7–8 in. long, rachis glabrous, leaflets subcoriaceous 5, less often 6 rarely 4 pairs, oblong-lanceolate apex obtuse or acute, base rounded or cuneate slightly oblique, 6–9 in. long, 2–3 in. wide, margins faintly undulate, dark-green shining above, dull and paler beneath, both sides quite glabrous; petiolules short ·2 in. long very stout, stipels deciduous; stipules small at first coriaceous, green, at length scarious, brown, the two united completely from base to apex into a convolute sheath for the subsequent bud, when laid open ovate-oblong ·4 in. long, ·25 in. wide, parallel-nerved and minutely laciniate at the wide tip. *Flowers* in dense corymbs 3–4 in. in diam., axillary; peduncles and pedicels reddish, glabrous, rather stout, basal bracts ovate-subacute with ciliolate margins, bracteoles 2 subopposed persistent ascending oblong-spathulate subacute amplexicaul, ·15 in. long, pedicels below bracteoles ·3–·5 in. long. *Calyx* bright-orange becoming at length red, tube ·5–·6 in. long, cylindric, about twice as long as limb of 4 obovate-oblong sepals. *Petals* 0. *Stamens* 7 or 8 with 2 rudimentary filaments, all filaments slightly widened and slightly connate at base, reddish, anthers nearly twice as long as broad, purple; filaments thrice as long as sepals. *Ovary* stalked, puberulous along the sutures elsewhere glabrous, 8–12-ovuled, in most flowers rudimentary and then quite glabrous; style filiform declinate nearly as long as filaments. *Pod* black, 4–10 in. long, 1·7 in. wide, linear-oblong, compressed, valves strongly wide-reticulate; stipe ·25 in. long. *Seeds* 4–8, oblong, compressed, 1·5 in. long. Miq. Flor. Ind. Bat. I, 83; Bedd. Fl. Sylv. t. 57; Bak. in Flor. Brit. Ind. II, 271. *S. arborescens* Burm. Fl. Ind. 85, t. 25, f. 2. *Jonesia Asoca* Roxb. As. Res. IV, 355; Fl. Ind. II, 218; DC. Prodr. II, 487; Wall. Cat. 5822; W. & A. Prodr. 284; Wight Ic. t. 206; Bot. Mag. t. 3018. *J. pinnata* Willd. Sp. Pl. II, 287.

Malacca; *fide* Baker in *Flora of Brit. India*. Probably planted; the species has never been sent to Calcutta by any Malayan botanist.

6. Saraca bijuga Prain. A tree with spreading branches 20–30 feet high, stem 6 in. to 2 feet thick; branches glabrous. *Leaves* with rachis 1 in. long, leaflets thinly subcoriaceous 2-, or not infrequently 1-jugate, oblong-lanceolate, apex gradually narrowed in the upper third to a sharp point, bases of terminal pair very oblique, rounded on lower cuneate on upper margin, of lower pair rounded or subcordate on both sides, 4–10 in. long, 1–2·75 in. wide, margins faintly undulate, dark-green

and shining above, dull and paler beneath, both sides quite glabrous; petiolules very short under ·1 in., stout, stipels deciduous; stipules small coriaceous at length scarious, completely united from base to apex, narrowly ovate-oblong ·6 in. long, ·2 in. wide, tip subacute. *Flowers* in dense corymbs 4–5 in. in diam., axillary, peduncles and pedicels reddish, glabrous, slender, basal bracts ovate-subacute with ciliolate margins, bracteoles 2 subopposed persistent spreading, ovate-obtuse not amplexicaul, ·15 in. long, pedicels below bracteoles ·15–·2 in. long. *Calyx* orange becoming at length light-red, tube ·25 in. long, cylindric, hardly longer than the limb of 4 ovate-obtuse sepals. *Petals* 0. *Stamens* 7 or 8, all filaments slightly widened and faintly connate at base, dark claret-coloured; anthers not much longer than broad; filaments thrice as long as sepals. *Ovary* stalked, very sparsely puberulous along sutures, in most flowers rudimentary and then quite glabrous. *Pod* reddish-yellow, smooth, polished, faintly reticulate, 6–8 in. long, 2·35 in. across; stipe ·2 in. long. *Seeds* 4–6.

Perak; Larut; in open jungle generally near running streams, *Kunstler* 2749! 2382! 4059! Kinta, near limestone hills, *Kunstler* 7221! Larut, *Scortechini* 1503! Batu Togoh, *Wray* 2152!

This is the nearest of the native Malayan species to the common Indian *Saraca indica;* it is however very distinct on account of its 2-jugate leaves, its smaller flowers with spreading bracteoles and its very different pods. Elsewhere the writer has indicated the possibility of this proving ultimately to be only a variety of the not very fully described Javanese *S. minor* Miq. But from Miquel's account of that plant this must be at least an exceedingly distinct variety.

7. Saraca macroptera Miq. Flor. Ind. Bat. I, 1080. A tree 30–40 feet high, stem 4–6 in. in diam. *Leaves* with rachis 4–15 in. long; leaflets rigidly subcoriaceous 4–7-paired, oblong-lanceolate, apex gradually narrowed to an acuminate tip, base slightly unequally rounded, 5–12 in. long, 1·5–3·5 in. wide, secondary nerves about 12 pairs, curving forward, prominent beneath, bright-green shining above, paler dull beneath; petiolules ·15 in. long, glabrous as is the rachis, stipels caducous; stipules completely united in a scarious bud-sheath ·5 in. long. *Flowers* in densely fascicled corymbs in leaf axils and on old nodes, 1 in. long, 1·5 in across; peduncles and pedicels quite glabrous very slender, the latter ·25–·3 in. long below the two ovate-oblong spreading persistent bracteoles ·15 in. long; bracts ovate-acute ·1 in. long. *Calyx* bright-yellow, tube slender cylindric ·25 in. long, exceeding the limb of 4 oblong sepals ·2 in. long. *Petals* 0. *Stamens* 3–4, twice as long as sepals, filaments slender and inserted on the crenately lobed disc; anthers short oblong. *Ovary* stalked glabrous. *Pod* not seen.

Perak; Larut, in low wet ground, *Kunstler* 5511! Distrib. Sumatra, Borneo.

This is extremely closely related to *S. palembanica* but is readily distinguished by its glabrous peduncles and pedicels, and its glabrous ovary. The solitary Perak gathering differs from the original Sumatrana specimens (n. 863 *Hort. Bogor*) in having much smaller flowers, but is not otherwise distinguishable. It may, on the whole, be better, however, to treat the Peninsular plant as a distinct variety, VAR. *parviflora*; unless it should be found that the two differ markedly in fruit they can hardly be looked upon as distinct species: as yet, the fruit is unknown in either plant.

8. SARACA PALEMBANICA Miq. ex Bak. in Flor. Brit. Ind. II, 272. A tree with spreading branches, 30–40 feet high, stem 8–10 in. in diam. *Leaves* with rachis 8 in. long; leaflets rigidly subcoriaceous 4–7 paired, oblong, apex obtuse shortly abruptly acuminate, base slightly unequally rounded, 5–14 in. long, 2·5–4·5 in. wide, secondary nerves about 12 pairs, curving forward, prominent beneath, dark-green above, paler beneath, rather dull; petiolules ·15 in. long, glabrous as is the rachis, stipels caducous; stipules completely united in a scarious bud-sheath ·5 in. long. *Flowers* in densely fascicled corymbs on old nodes, 2 in. long nearly as much across; peduncles and pedicels pubescent, slender, the latter ·5 in. long below the two ovate-oblong spreading persistent bracteoles ·2 in. long; bracts ovate-subacute ·2 in. long. *Calyx* orange-yellow, tube slender cylindric ·35 in. long, exceeding the limb of 4 oblong sepals ·25 in. long. *Petals* 0. *Stamens* 4, at times only 3, two and a half times as long as sepals, filaments slender and inserted in the retiring angles of a crenately lobed fleshy ring, deep-purple as are the shortly oblong anthers. *Ovary* stalked, densely hairy, in most flowers rudimentary and then subglabrous. *Pod* not seen. *Jonesia* (Saraca) *palembanica* Miq. Flor. Ind. Bat. Suppl. 291.

PENANG; Kulang Ulu, *Curtis* 647! PANGKORE; Dindings river, *Curtis* 1386! MALACCA; *Maingay!* DINDINGS TERRITORY; "in wet low lands," *Bryant!* PERAK; Larut, "in low wet ground," *Kunstler* 6372! *Scortechini* 138! DISTRIB. Sumatra.

This is very near *S. macroptera* Miq. but differs in having rather smaller flowers, with pubescent peduncles and pedicels, and more densely clustered corymbs. Miquel describes the ovary as glabrous, but it is densely pubescent except in the case of the abortive ovaries which occur, however, in the vast majority of the flowers. Though its leaves very much resemble those of *S. macroptera*, it is less closely allied to that species than it is to *S. triandra*, a species which is much more common in the Malay Peninsula than either of the others.

9. SARACA TRIANDRA Bak. in Flor. Brit. Ind. II, 272. A slender tree 15–30 feet high, stem 4–8 in. in diam. *Leaves* with rachis 1·5–3 in. long; leaflets thinly subcoriaceous, 2–3-, very rarely 4-paired, oblanceolate-oblong, obtuse with or without an abrupt acumen, or subacute, tapering from beyond the middle to a cuneate base, lower pair very rarely rounded at base, and narrowed towards apex; 5–12 in. long, 2–6 in. wide, secondary nerves about 12 pairs, the lowest pair distinctly

marginal to half-way up, the others curving forward prominent beneath; dark-green shining above, dull beneath, glabrous on both surfaces; petiolules ·15 in. long, glabrous as is the rachis, stipels caducous; stipules completely united in a scarious bud-sheath ·5 in. long. *Flowers* in lax fascicled corymbs in leaf-axils and on old nodes, 5–8 in. long and broad; peduncles and pedicels slender pubescent, the latter ·75 in. long below the two ovate-oblong spreading persistent bracteoles ·25 in long; bracts ovate subacute ·2 in. long. *Calyx* yellow becoming pink or red, tube slender cylindric, ·25 in. long, about as long as limb of 4 oblong sepals. *Petals* 0. *Stamens* 3–4, two and a half to three times as long as sepals, filaments slender, inserted on a crenated fleshy ring, purplish as are the anthers. *Ovary* long-stalked, densely pubescent, mostly rudimentary. *Pod* oblong, very obliquely rounded at base on lower suture, obliquely obtuse at apex with lower suture projecting as a beak ·25 in. long; 4–6 in. long, 1·5–1·75 in. wide, much compressed, valves brown when ripe, uniformly finely puberulous. *Seeds* 3–4.

Malacca; *Griffith! Miller! Hervey! Goodenough* 1463! 1478! *Maingay* 563! Perak; in dry rocky places, *Kunstler* 2138! 2757! 3484! 3797! 3886! 3912! 3957! 4507! 4517! 5563! 7912! 8516! 8561! *Ridley* 3026! 3099! *Wray* 41! *Scortechini* 1143! 1675! Penang; Government Hill, *Curtis* 165! Dindings; at Rajah Hitam, *Bryant!* Distrib.; Sumatra, (Moera Enim; *Teysmann* 3638!)

Mr. Goodenough gives the native name of this as "*Talan*." The species is remarkably closely related to *S. palembanica* and differs only by its larger laxer corymbs and its fewer leaflets, and further investigation on the part of field-botanists in Malaya may demonstrate that Mr. Baker's species is only a form assumed in dry localities by the tree that was previously described by Miquel as *Jonesia palembanica*. Both the synomyms of the *Flora of British India* should be deleted, for *Jonesia triandra* Roxb. is *Afzelia bijuga*, while *J. scandens* Roxb. is, by Roxburgh's definition, clearly not this species and probably not a *Saraca* at all.

10. Saraca latistipulata Prain. A small tree with slender leafy pubescent branches. *Leaves* 8 in. long, rachis puberulous, leaflets rigidly coriaceous, 6 pairs, ovate-lanceolate, apex acuminate, base slightly obliquely rounded, 4·5–6 in. long, 1·5 in. across, dark-green, dull glabrous above, pubescent on the midrib beneath and puberulous along the margins, petiolules short, ·15 in. long, pubescent, stipels small subulate persistent pubescent; stipules large foliaceous each with a strong midrib, ovate-acute, auriculate at base on their outer free margin, connate between petiole and branch for one-third their length on the inner margin, from ·5–1·5 in. long, ·25–1 in. wide, usually slightly unequal. *Flowers* in very few-flowered cymes, sometimes reduced to single pedicels, clustered on rugose woody nodes along thick old branches, under ·75 in. long; with ovate-lanceolate persistent basal bracts and two sub-

opposite amplexicaul triangular persistent erect bracteoles midway between bract and calyx-tube, pedicels and bracteoles puberulous. *Calyx* white, tube cylindric ·15 in. long, shorter than limb of 4 narrow-oblong sepals, pubescent along margin at tip. *Petals* 0. *Stamens* 2 with a rudimentary filament between them, opposite to and involved by the inmost calyx segment; filaments widened at base and subconnate, pink; anthers nearly twice as long as broad, filaments twice as long as sepals. *Ovary* pubescent. *Pod* oblong, obliquely obtuse at apex with a rather pronounced beak, obliquely rounded at base, 2 in. long, ·1 in. across.

Perak; Dindings, Lumut, *Ridley* 3089! 8006!

A very remarkable species, easily distinguished from all those hitherto known by its large foliaceous stipules, and its stipellate leaves with pubescent rachis. It has been obtained twice, both times in the same locality, and on both occasions by Mr. Ridley.

53. Crudia Schreb.

Shrubs or trees. *Leaves* odd-pinnate or spuriously even-pinnate by the approximation of the penultimate to the terminal leaflet, the leaf-rachis sometimes prolonged beyond the ultimate leaflet, the remaining leaflets usually conspicuously alternate rarely occasionally subopposed; stipules interpetiolar, stipels 0. *Flowers* in racemes either terminating, or simple or in clusters at the bases of, the glabrous or pubescent new leafy shoots. *Calyx*-tube very short, with a short disc, segments 4 oblong, imbricated, persistent, reflexed in flower. *Petals* 0. *Stamens* 10 (or 8–9) exserted, filaments free filiform, anthers oblong, versatile, dehiscing longitudinally. *Ovary* pubescent, few-ovuled; with distinct short glabrous stalk and filiform incurved glabrous style; stigma terminal capitate, small. *Pod* with 2 rigidly coriaceous subcompressed valves. *Seeds* few, often only 1, exalbuminous. Species, one each Indian and African; nine or ten American; about twelve Malayan.

The oldest names for this genus, according to the *Index Kewensis*, are *Aplatoa* Aubl. and *Touchiroa* Aubl. As the first name was based on the flowers of one species of this genus with the fruit of a *Pterocarpus*, it cannot possibly be used. There seems nothing against the employment of the second name which was given to a species of the group with few leaflets to the leaf-rachis — the group to which *C. bantamensis*, *C. gracilis* and *C. Wrayi*, among Malayan species, belong.

Leaflets more than 3 (§ *Crudia*):—

Leaflets coriaceous, very long caudate-acuminate, rachis prolonged beyond the last of the oblanceolate, all conspicuously alternate leaflets; (innovations and petioles densely rusty-tomentose) ... ... 1. *C. caudata.*

Leaflets papery, acute or shortly acuminate, rachis not prolonged beyond the two terminal, often spuriously opposite leaflets :—

Innovations and petioles pubescent, leaflets uniformly puberulous or pubescent beneath; racemes rather lax; petiolules and pedicels rather long :—

Leaflets 11–13, lanceolate, pubescence tawny, pod densely rusty-pubescent ... ... 2. *C. Scortechinii.*

Leaflets 7–9, obovate to oblong, pubescence grey, pod tawny-puberulous... ... ... 3. *C. Curtisii.*

[Leaflets puberulous beneath; apex shortly acuminate ... ... VAR. *typica*;

Leaflets densely pubescent beneath; apex acute ... ... VAR.? *Wallichii.*]

Innovations and petioles glabrous; racemes rather dense; petiolules and pedicels rather short :—

Leaflets 7–8, glaucous, glabrous on the nerves, elsewhere uniformly puberulous beneath ... ... 4. *C. glauca.*

Leaflets 5 (rarely 3), pale-green, quite glabrous beneath ... ... 5. *C. speciosa.*

Leaflets 3 or by abortion fewer (§ *Touchiroa*) :—

Leaflets small oblanceolate, racemes dense with puberulous rachis and pedicelled flowers ... ... 6. *C. Wrayi.*

Leaflets large ovate-oblong, racemes sparse with glabrous rachis and sessile flowers ... ... 7. *C. gracilis.*

1. CRUDIA CAUDATA Prain. A small tree with slender at length glabrescent branches, and densely rusty-tomentose new shoots. *Leaves* odd-pinnate, rachis 1·5–2 in. long, petiole articulate, the interpetiolar stipules united by their inner margins at the base only, elsewhere free, lanceolate, densely rusty-pubescent on their petiolar, glabrous on their axillary aspect; leaflets 5–7, petiolules ·1 in long, densely rusty-tomentose as is the rachis, which is prolonged beyond the last leaflet into a subulate process; alternate, oblanceolate, base rounded in lower, deltoid in upper leaflets, apex prolonged into a ·75 in. long, narrow-caudate tip, 2·5–4 in. long, 1 in. across, rigidly coriaceous, dark-green glabrous and shining above, dull and densely rusty-pubescent on the nerves beneath, lateral nerves 6–7 pairs slightly ascending, looped within the margin, secondary venation prominent beneath, all nerves obscure above. *Flowers* in narrow racemes at the bases of new leafy shoots, with round densely rusty-tomentose rachis, pedicels rather stout, under ·25 in. long, densely rusty with a subulate bracteole close under calyx; buds oblong ·2 in. long. *Calyx*-tube very short, lobes 4, imbricate, reflexed in flower, densely rusty outside, quite glabrous within. *Stamens* not seen. *Ovary* stipitate, densely rusty-velvety, 1-ovuled, stalk glabrous as long as calyx-tube. *Pod* (young) linear-oblong, obliquely rounded at base,

apex obtuse apiculate, compressed, 2 in. long, ·75 in. across, valves densely, shortly, subscabridly rusty-pubescent. *Seed* 1. *Touchiroa caudata* Prain MSS.

Johore; Tanjong Kupang, *Ridley* 6399! Distrib. Borneo.

A remarkably distinct species, though recalling in some respects the description given by Hasskarl of *C. orientalis* (*Cat. Hort. Bog.* 288). Hasskarl's species has, however, more numerous leaflets which are only rusty-pubescent on their margins; it has also larger, 2-seeded pods.

2. Crudia Scortechinii Prain. A tree 80–90 feet high, young branches tawny-pubescent. *Leaves* odd-pinnate, rachis 6–8 in. long, petiole articulate on an auricled node with an interpetiolar entire stipule, leaflets 11–13, with petiolules ·2 in. long, sparsely tawny-pubescent as is the rachis, alternate, lanceolate, base slightly unequally rounded, apex acuminate, 2–3 in. long, 1 in. wide, papery, green and glabrous above, paler and pubescent with short sparse tawny hairs beneath, lateral nerves spreading, 12–16 pairs, not much stronger than the fine secondary venation. *Flowers* in narrow racemes at the ends and bases of new leafy shoots, 3–6 in. long, with angular tawny-pubescent rachis; pedicels slender at length ·4 in. long, tawny-puberulous, many of the lower caducous, minutely bracteolate about the middle; buds oblong ·2 in. long. *Calyx*-tube very short lined by a disc, lobes 4, imbricate in bud reflexed in flower, sparsely pubescent on both surfaces. *Petals* 0. *Stamens* 9, filaments glabrous, free, alternately short and long, anthers broadly ovate, versatile. *Ovary* stipitate, densely tawny-villous, 1- or 2-ovuled; stalk glabrous as long as calyx-tube, style glabrous incurved. *Pod* oblong, obliquely rounded at both ends, densely rusty-tomentose, rugulose, 2·5 in. long, 1·5 in. across, flat. *Seed* 1, funiculus elongated. *Touchiroa Scortechinii* Prain MSS.

Perak; Goping, *Scortechini* 2129!

A very distinct species.

3. Crudia Curtisii Prain. A tall tree 80–150 feet high with spreading crown and densely grey-pubescent branchlets; stem 2–3 feet in diam. *Leaves* odd-pinnate, rachis 3–4 in. long, petiole articulate on an auricled node with an interpetiolar 2-lobed stipule, leaflets 7–9, with petiolules ·25 in. long, closely puberulous as is the rachis, alternate, obovate to oblong, base slightly obliquely rounded or cuneate, apex rounded or tapering to an at length bluntly caudate tip, 2–3·5 in. long, 1–1·5 in. wide, membranous, green and glabrous above, paler and uniformly sparsely puberulous beneath, lateral nerves ascending prominently looped within margin, secondary venation indistinct. *Flowers* in rather lax narrow racemes at the ends and bases of new leafy shoots, 4–6 in. long, with angular densely grey-pubescent rachis; pedicels very

slender, at length ·6 in long, grey-puberulous, with a caducous subulate bracteole about the middle; buds oblong ·15 in long. *Calyx*-tube very short, lobes 4, imbricate, reflexed in flower, sparsely pubescent externally, glabrous within. *Petals* 0. *Stamens* 10, filaments glabrous, free, alternately long and short, anthers broadly oblong, versatile. *Ovary* stipitate densely grey-downy, 1- or 2-ovuled, stalk glabrous longer than calyx-tube, style glabrous incurved. *Pod* oblong, obliquely rounded at base, subequally rounded and apiculate at tip, rusty-puberulous, rather distinctly reticulate, 3 in. long, 2 in. wide, ·5 in. thick, valves very firmly coriaceous. *Seed* 1, oblong, 1·25 in. long, 1·2 in. wide, ·35 in. thick. *Touchiroa Curtisii* Prain MSS.

PENANG; Govt. Hill, 1200 feet elev., *Curtis* 3007! MALACCA; Bukit Sadanan, *Derry* 1164! PERAK; Larut, *Kunstler* 7467! Thaiping, *Kunstler* 8514! Kinta, *Kunstler* 4753!

VAR. ? *Wallichii* Prain; leaf-rachis and leaflets beneath densely softly velvety; leaflets acute, not cuspidate or caudate at the tip. *Leguminosa* Wall. Cat. 5983. *Ignota* Wall. Cat. 8089. *Touchiroa Wallichii* Prain MSS.

PENANG; *Porter* (Wall. Cat. 5983)! *Wallich* (Cat. 8089)!

This fine tree is, according to Mr. Derry, known in Malacca as '*Kumpas ruman*.' Though very nearly related to *C. glauca* it seems to be quite distinct and is easily separated by its longer petiolules; pubescent leaf-rachis, rachis of inflorescence and young leafy shoots; also by its rather smaller leaflets and pods. It is likewise very closely related to *C. speciosa* but it has longer pedicels and a less dense inflorescence than that species, which moreover has the leaflets quite glabrous.

The plant here tentatively referred to the species as VAR. ? *Wallichii* occurs twice in the Wallichian Herbarium, on both occasions without flowers or fruits. It has never been obtained again and it is just possible that when it is re-discovered it will prove a distinct species, *C. Wallichii*.

4. CRUDIA GLAUCA Prain. A tree 50–70 feet high, with spreading glabrous branches; stem 1·5–2·5 feet in diam. *Leaves* odd- (or sometimes even-) pinnate, rachis 2–2·5 in. long, petiole articulate on an auricled node with an interpetiolar 2-lobed stipule, leaflets 7–8, with petiolules ·15 in. long, quite glabrous as is the rachis, alternate or occasionally subopposite, oblanceolate-oblong, base slightly obliquely rounded, apex rounded and at length abruptly obtusely cuspidate, 2·5–4 in. long, 1·25–1·75 in. wide, thinly papery, dark-green and quite glabrous above, very glaucous glabrous on the nerves elsewhere finely adpressed-puberulous beneath, lateral nerves ascending, prominently looped one-third their length within the margin, secondary venation indistinct. *Flowers* in dense narrow racemes at the bases of new leafy shoots, 3–5 in. long, with angular glabrous rachis. *Calyx* not seen. *Pod* oblong tapering subequally at base to a stipe ·25 in. long, and at apex to a

short acute beak, closely tawny-puberulous, rather distinctly reticulate, 4 in. long, 2 in. wide, ·6 in. thick; valves very firmly coriaceous. *Seed* 1, oblong, 1·5 in. long, 1·2 in. across, ·4 in. thick. *Touchiroa glauca* Prain MSS.

Perak; Goping, *Kunstler* 8175!

This is very nearly related to *C. Curtisii* but differs markedly in having leaflets very glaucous beneath, the leaflets being also rather larger and the petiolules shorter; in having the leaf-rachis, petiolules, and nerves beneath glabrous; and in having, as is shown by the scars on the rachis of the infruitescence, much more densely flowered racemes; the pods also are larger than in *C. Curtisii*. Flowers have not yet been sent. Of all the Malayan species, this is the one that most nearly approaches the Ceylon *C. zeylanica*.

5. Crudia speciosa Prain. A handsome tree with slender pendulous glabrous branches and glabrescent new shoots. *Leaves* odd-pinnate, rachis 2–3 in. long, petiole articulate on an auriculate node, with an interpetiolar 2-lobed stipule, leaflets 5 (rarely 3), with petiolules ·15 in. long, glabrous as is the rachis; alternate, oblong, base unequally rounded or truncate, apex abruptly tapering to a short acutely caudate tip, 2–2·5 in. long, 1–1·5 in. wide, papery, dark-green above, paler beneath, quite glabrous or both surfaces, lateral nerves spreading slender, looped within margin, hardly more prominent than secondary venation. *Flowers* in rather dense narrow racemes at the ends of new leafy shoots, 6–10 in. long with round glabrescent rachis; pedicels spreading, very slender, quite glabrous, ·35 in. long, with a minute bracteole below the middle; buds oblong, ·25 in. long. *Calyx*-tube very short, lobes 4, imbricate, reflexed in flower, very sparsely puberulous externally, glabrous within. *Petals* 0. *Stamens* 10, filaments glabrous, free, alternately short and long, anthers broadly oblong, versatile. *Ovary* stipitate, densely pubescent, 1- or 2-ovuled; stalk as long as calyx-tube, glabrous, style glabrous incurved. *Pod* not seen. *Touchiroa speciosa* Prain MSS.

Pungah; "a very handsome tree with dark-green leaves and slender pendulous branches; growing in the Rajah's Garden," *Curtis* 2955!

Nearest to *C. Curtisii* and *C. glauca* but evidently quite distinct from both.

6. Crudia Wrayi Prain. A small tree with slender glabrous branches. *Leaves* odd-pinnate, rachis 1 in. long, petiole articulate on an auriculate node, the interpetiolar lanceolate stipules united at their very base only, glabrous as are the leaf-rachis and the petiolules, ·15 in. long; leaflets 3, alternate, oblanceolate, base cuneate, apex acute or rounded and shortly abruptly acuminate, 1·5–2·5 in. long, ·5–1 in. wide, thinly papery, pale yellowish-green, glabrous on both surfaces, lateral nerves spreading, 7–8 pairs, slender, looped within margin, secondary nervation fine but distinct. *Flowers* in narrow dense racemes at the ends and

bases of new leafy shoots, 4–8 in. long, with angular puberulous rachis; pedicels slender ·2 in. long, puberulous, bracteolate in the middle; buds oblong, ·15 in. long. *Calyx*-tube very short, lobes 4, imbricate in bud, spreading in flower, faintly puberulous outside, glabrous within. *Petals* 0. *Stamens* 8–9, alternately long and short, anthers broadly ovate, versatile. *Ovary* shortly stipitate, densely pubescent, 1- or 2-ovuled; stalk glabrous equalling calyx-tube, style glabrous incurved. *Pod* unknown. *Touchiroa Wrayi* Prain MSS.

Perak; Larut, at Sungei on the plains, *Wray* 2874!

This is a member of the group of species forming the original genus *Touchiroa*, to which *C. bantamensis* and *C. gracilis*, among Malayan species, also belong. But *C. Wrayi* is easily distinguished from both the species mentioned by its very small leaflets and its much longer pedicels; the flowers, except for having longer stalks, are extremely like those of *C. bantamensis*.

7. Crudia gracilis Prain. A slender shrub 6–8 feet high, young branches glabrous. *Leaves* odd-pinnate, rachis ·75–1 in. long, petiole articulate on a small node, with interpetiolar glabrous lanceolate stipules united only at their very bases, leaflets 3 (or occasionally 2 from abortion of one lateral leaflet), with stout petiolules ·25 in. long, glabrous as is the rachis; alternate, ovate-oblong to oblong-lanceolate, base cuneate or slightly unequally rounded, apex shortly caudate-acuminate, 4·5–6 in. long, 2–3 in. across, firmly papery, pale yellowish-green, glabrous on both surfaces, lateral nerves ascending, about 6 pairs, distinct, secondary venation somewhat distinct beneath. *Flowers* in very narrow sparse spikes at the ends of new leafy shoots, 10–12 in. long with angular quite glabrous rachis; sessile, minutely bracteolate below the calyx; buds oblong, ·15 in. long. *Calyx*-tube very short, lobes 4, imbricate in bud, spreading in flower, quite glabrous on both surfaces. *Petals* 0. *Stamens* 8–9, filaments glabrous, free, alternately short and long, anthers broadly ovate, versatile. *Ovary* shortly stipitate, densely pubescent, 1- or 2-ovuled; stalk glabrous, shorter than calyx-tube, style glabrous incurved. *Pod* unknown. *Touchiroa gracilis* Prain MSS.

Perak; Thaiping, in low wet ground in dense forest, rare, *Kunstler* 8468!

This is extremely closely related to *Touchiroa bantamensis* Hassk. which has also 3- (or by abortion 2-) foliolate leaves, but has larger leaflets, puberulous rachis and sepals, and distinct though very short pedicels.

54. Peltophorum Vogel.

Tall unarmed trees. *Leaves* abruptly bipinnate. *Flowers* showy, yellow or white, in axillary and in panicled terminal racemes. *Calyx* with the disc confined to the base, teeth subequal, very deeply cut, imbricate. *Petals* oblong or roundish, imbricated, spreading. *Stamens*

10, free, declinate; filaments with a dense tuft of hairs at the base; anthers uniform, linear-oblong. *Ovary* sessile, free, few-ovuled; style long filiform incurved, stigma large peltate. *Pod* oblong, flat, thin, hard, indehiscent, with a firm broad wing on each suture. Species 7–8; cosmopolitan in the tropics.

Flowering pedicels not exceeding the calyx ...	... 1. *P. ferrugineum.*
Flowering pedicels 3–4 times as long as calyx ...	... 2. *P. dasyrachis.*

1. Peltophorum ferrugineum Benth. Flor. Austral. II, 279. A tall tree 70–80 feet high; branchlets covered with a thin rusty tomentum. *Leaves* 6–12 in. long, petiole 1–1·5 in., sparingly rusty-pubescent; pinnæ 16–20, distal 4–6 in. long, progressively shortening towards proximal, 3–4 in.; leaflets close, ligulate-oblong, sessile, base unequal, apex obtuse, ·5–·75 in. long, ·35 in. wide, subcoriaceous, puberulous above, faintly rusty-pubescent beneath. *Racemes* in a large terminal panicle 12 in. long, 8–9 in. across, branches 4–6 in. long, bracts linear under 1 in. long, very caducous, bud ·35 in. in diam., pedicels ·15–·25 in. long, rachis, branches and pedicels densely rusty-pubescent. *Calyx* partite to ·15 in. from base, lobes subequal, ovate-lanceolate, ·25 in. long, densely rusty-pubescent externally. *Corolla* 1·25 in. wide, petals ·8 in. long, yellow, the thickened base densely rusty-hairy on both sides, the blade more or less glabrous but the margin ciliate with rusty hairs. *Stamens* 10, free, filaments equal, pubescent at the base. *Ovary* densely villous, style very sparingly pubescent throughout, the stigma peltate. *Pod* 2–4 in. long, 1 in. across, narrowed to both ends, rigid, glabrous, closely longitudinally veined outside. Bak. in Flor. Brit. Ind. II, 257. *Poinciana Roxburghii* G. Don, Gen. Syst, II, 433. *Cæsalpinia inermis* Roxb. Flor. Ind. II, 367. *C. ferruginea* Dcne, Nouv. Ann. Mus. II, 462; Miq. Flor. Ind. Bat. I, 111. *C. arborea* Zoll. Nat. en Geneesk. Arch. III, 65; Miq. Flor. Ind. Bat. I, 112.

Andamans; *Kurz!* Nicobars; *Jelinek* 240! *Heinig!* Kedah; Langkawi, *Curtis* 370! Malacca; *Griffith* 1903! *Hervey* 2078! Singapore; *Ridley* 265! Johore; *Ridley* 3977! Distrib. Borneo (*Hullett*); Java; Timor.

2. Peltophorum dasyrachis Kurz ex Bak. in Flor. Brit. Ind. II, 257. A tall tree 70–80 feet high; branchlets covered with a fulvous tomentum. *Leaves* 6–15 in. long, petiole 1–1·5 in. long, tomentose; pinnæ 14–18, distal 4–5 in. long, shortening progressively towards proximal 2–2·5 in.; leaflets close, ligulate-oblong, sessile, base unequal, apex rounded, ·5–·75 in. long, ·35 in. wide, subcoriaceous, puberulous above, slightly rusty-pubescent beneath. *Racemes* 6–9 in. long, 3 in. across, pedicels patent 1–1·5 in. long, bracts lanceolate, ·5 in. long, subpersistent; bud ·35 in. in diam.; rachis, pedicels and bracts rusty-pubescent. *Calyx* partite to ·15 in. from base, lobes equal, ovate-lanceolate, ·25 in. long,

densely rusty-velvety externally. *Corolla* 1·5 in. across, petals 1 in. long, oblong, yellow, the thickened base very densely hairy on both sides, the blade glabrous. *Stamens* 10, free, filaments equal, pubescent at the base. *Ovary* densely villous, style sparsely pubescent throughout, the stigma large peltate glabrous. *Pod* 4–5 in. long, 1·25–1·4 in. across, rigid, 1–5-seeded, narrowed at both ends, faintly puberulous and not veined externally. *Cæsalpinia Finlaysoniana* Grah. in Wall. Cat. 5971. *C. dasyrachis* Miq. Flor. Ind. Bat. Suppl. 292.

PERAK; Goping, *Scortechini*, 1994! Trang, *Kunstler* 1394! 8172! MALACCA; common, *Griffith!* *Maingay* 560! *Holmberg* 884! *Derry* 1049! DISTRIB. Sumatra.

The native name in Malacca is "*Batai*" or "*Kayu Batai*."

There is a third species of *Peltophorum* in Sumatra (*P. grande*), a very tall tree with white flowers tinged with pink.

55. CÆSALPINIA Linn.

Robust erect trees, shrubs, or woody prickly climbers. *Leaves* large, abruptly bipinnate. *Flowers* showy, yellow, in copious axillary racemes. *Calyx* deeply cleft, with the disc confined to its base, the lobes imbricated, the lowest the largest, cucullate. *Petals* spreading, usually orbicular with a distinct claw, the uppermost smaller than the others. *Stamens* 10, free, declinate; anthers oblong, uniform, versatile. *Ovary* sessile or subsessile, few-ovuled; style filiform, sometimes clubbed at the tip, stigma terminal. *Pod* oblong or ligulate, thin and flat, or thicker and subturgid, indehiscent or dehiscent, smooth or (in SUBGEN. *Guilandina*) armed all over with wiry spines. Species about 40, widely spread in the tropics of both hemispheres.

Pod armed with abundant wiry prickles; petals narrow (GUILANDINA):—
- Leaves stipulate, leaflets small, bracts squarrose ... 1. *C. Bonducella.*
- Leaves without stipules, leaflets larger, bracts ascending ... 2. *C. Bonduc.*

Pod unarmed, petals broad:—
- Pod dry, thin-valved with narrow sutures (EUCÆSALPINIA):—
  - Leaflets few, coriaceous, large; pods short, seeds solitary or rarely 2 (§ *Nugaria*) ... ... 3. *C. Nuga.*
  - Leaflets many, membranous or subcoriaceous, small; pods longer than broad, seeds 5–8:—
    - Stamens long, far-exserted; petals long-clawed (§ *Cæsalpinaria*)... ... ... 4. *C. pulcherrima.*
    - Stamens short, little-exserted; petals short-clawed (§ *Sappania*):—
      - Petals orbicular, flowers ·75 in. across:—
        - Stipules 0, petals subequal, pod wingless broadly blunt-pointed with recurved beak ... ... 5. *C. Sappan.*

Stipules large, upper petal smaller than the others, pod narrowly winged along ventral suture, obliquely round-pointed with straight beak ... 6. *C. sepiaria.*

Petals oblong (subequal), flowers only ·3 in. across, (pod wingless, broadly blunt-pointed with straight beak) ... ... 7. *C. parviflora.*

Pod somewhat fleshy, thick-valved with wide sutures (Cinclidocarpus):—

Leaflets oblong; racemes lax, pedicels much exceeding calyx ... ... 8. *C. digyna.*

Leaflets ligulate, racemes denser, pedicels hardly exceeding calyx ... ... 9. *C. tortuosa.*

Subgen. 1. Guilandina Bak. *Pod* dry, armed on the face with abundant wiry prickles; *petals* narrow.

1. Cæsalpinia Bonducella Fleming, Asiat. Research. XI, 159. A climber, often very extensive, with finely grey-downy branches armed with many small hard falcate yellow prickles. *Leaves* 1 to 2 feet long, with a pair of reduced pinnæ (or compound stipules) at their base; pinnæ 12–16, 2–3 in. long, slightly lengthening upwards, leaflets 12–18, membranous, rather pale-green, ovate or elliptic, base slightly unequally rounded, apex cuneate or rounded mucronulate, ·5–1 in. long, ·3–·6 in. wide, glabrous above, slightly puberulous beneath, more closely on the margins, petiolules very short; lobes of compound stipules suborbicular. *Racemes* terminal and slightly supra-axillary, simple or panicled, dense at top, laxer downwards, 6–10 in. long; pedicels ·2 in. (in fruit ·3 in.) long, with squarrose reflexed lanceolate deciduous bracts ·25–·3 in. long, finely brown-downy as are the pedicels and main-rachis. *Calyx* ·25–·3 in. long, closely downy. *Petals* oblanceolate, little exserted, yellow except the broader shorter ovate-acute upper with reddish base. *Stamens* densely grey-silky, declinate. *Pod* short-stalked, oblong, 2–3 in. long, 1·75 in. wide, densely strongly aculeate externally. *Seeds* usually 2, oblong, lead coloured, ·5 in. across. Roxb. Flor. Ind. II, 357; Bak. in Flor. Brit. Ind. II, 254. *Guilandina Bonducella* Linn. Sp. Pl. 381; Wall. Cat. 5803. *G. Bonduc* W. & A. Prodr. 280 in part; Miq. Flor. Ind. Bat. I, 113 in part.

Andamans; common on the coasts. Penang; *Curtis* 99! Distrib. Cosmopolitan in the tropics.

2. Cæsalpinia Bonduc Roxb. Hort. Beng. 32. A large shrubby creeper often very extensive, with sparingly pubescent branches armed with rather strong falcate brown prickles. *Leaves* 1–2 feet long, without stipules; pinnæ 8–16, 5–8 in. long, slightly lengthening upwards, leaflets 12–14, papery, ovate, base subequally rounded, apex cuneate mucronate, 1·5–2 in. long, ·75–1 in. wide, dark-green shining glabrous above, rather closely puberulous beneath, petiolules ·08 in. long. *Racemes*

terminal and supra-axillary simple or panicled, rather lax throughout, 6–12 in. long; pedicels ·2 (in fruit ·3) in. long, with membranous lanceolate deciduous bracts ·2 in. long, finely brown-pubescent as are the pedicels and main-rachis. *Calyx* ·2–·25 in. long, closely downy, light-green, tinged with pink. *Petals* oblanceolate, little exserted, yellow. *Stamens* silky, declinate. *Pod* rather distinctly stipitate, oblong, 5 in. long, 2·5 in. wide, sparsely strongly aculeate externally. *Seeds* usually 4, oblong, ·5 in. across. Roxb. Flor. Ind. II, 362; Bak. in Flor. Brit. Ind. II, 255. *Guilandina Bonduc* Linn. Sp. Pl. 381; DC. Prodr. II, 480; Wall. Cat. 5806; W. & A. Prodr. 280 in part; Miq. Flor. Ind. Bat. I, 113 in part.

Nicobars; *King's Collector!* Penang; *Wallich* 5806! Pahang; *Ridley* 2650! Perak; *Scortechini* 1062! *Kunstler* 7147! *Wray* 3089! Distrib. Cosmopolitan in the tropics.

Subgen. 2. Eucæsalpinia. *Pod* dry, unarmed, valves thin; petals broad.

§ 1. Nugaria DC. *Leaflets* few coriaceous shining; *petals* short-clawed; *stamens* not far exserted; *seeds* 1, rarely 2.

3. Cæsalpinia Nuga Ait. Hort. Kew. III, 32. A very extensive littoral climber, with glabrous green branches armed with very strong, short, hard, dark, hooked prickles. *Leaves* 6–12 in. long, pinnæ 6–8, rather remote, subequal, 2–3 in. long, leaflets 4 or (oftener) 6, rigidly coriaceous, dark-green and shining above, ovate, acute or very rarely obtuse, base slightly unequally rounded or sometimes cuneate, 1–2·5 in. long, ·5–1 in. wide, quite glabrous on both surfaces; petiolules ·15 in. long. *Racemes* in a terminal panicle extending into the axils of the uppermost leaves, 10–15 in. long, 6–8 in. across, individual racemes 2·5–3 in. long; pedicels ·3 (in fruit ·5) in. long, with small ovate-lanceolate deciduous bracts ·1 in. long. *Calyx* ·25–·3 in. long, leathery, quite glabrous. *Corolla* ·5 in. across, fragrant, petals yellow, orbicular except the rather smaller ovate-acute upper blotched with red. *Stamens* densely woolly at base, declinate. *Pod* 2 in. long, 1·35 in wide, oblong, beaked, hard, slightly turgid, indehiscent. *Seed* solitary, black, 1 in. long, ·75 in. wide. DC. Prodr. II, 481; Miq. Flor. Ind. Bat. I, 108; Bak. in Flor. Brit. Ind. II, 255. *Cæsalpinia paniculata* Desf. Cat. ed. 2, 210; Roxb. Hort. Beng. 32; DC. Prodr. II, 481; Roxb. Flor. Ind. II, 364; W. & A. Prodr. 281; Wight, Ic. t. 36. *C. sumatrana* Wall. Cat. 5831 B, C, not of Roxb. *C. bijuga* Wall. Cat. 5833, not of Sw. *C. scandens* Kœnig in Roth, Nov. Sp. 289; DC. Prodr. II, 482; Wall. Cat. 5829. *Guilandina Nuga* Linn. Sp. Pl. ed. II, 545. *Nuga sylvarum* Rumph. Herb. Amboin. V, t 50.

Andamans; very common on all the coasts and near muddy creeks.

Nicobars; common. Kedah; Pulo Langkawi, *Curtis* 2618! 2867! Perak; *Scortechini* 1096! *Kunstler* 1029! Malacca; *Griffith* 1898! Pahang; *Ridley* 1377! Distrib. Coasts of S.-E. Asia, North Australia and Western Polynesia.

The nearest ally of this species is not any plant known as a *Cæsalpinia*, but a species from China known as *Mezoneuron sinense*.

§ 2. Cæsalpinaria Bth. & Hk. f. *Leaflets* small, numerous, membranous; *petals* very long-clawed; *stamens* very far exserted; *seeds* 6–8.

4. Cæsalpinia pulcherrima Sw. Obs. 166. A shrub with glabrous unarmed or very sparsely and weakly prickly branches. *Leaves* 4–6 in. long, pinnæ 12–16, 2–4 in. long, the proximal and distal rather shorter than those between, leaflets 16–24, distinctly petiolulate, close, membranous, elliptic-oblong, apex obtuse, base slightly oblique, cuneate on upper rounded on lower side, ·5–·7 in. long, ·35–·45 in. wide, dark-green, glabrous on both surfaces. *Racemes* terminal and axillary, simple or very sparingly branched, 8–12 in. long, at length subcorymbose, 4–6 in. wide, pedicels ascending, the lowest reaching 3–4 in. in length; bracts subulate ·2 in. long, very early caducous. *Calyx* ·6 in. long, quite glabrous, leathery, the lower segment very large and deeply cucullate, ·4 in. wide. *Corolla* spreading, 1·5 in. across, all petals long-clawed, the lower four ·75 in. long, yellow or red, lamina orbicular with crisped margin, ·5 in. in diam., the upper smaller. *Stamens* far-exserted, red, glabrous, 1·75 in. long. *Pod* thin, flat, ligulate, glabrous, nearly straight, 2–3 in. long, ·6 in. wide; seeds 6–8, broadly oval, compressed, brown, ·4 in. long, ·3 in. wide. Benth. Pl. Jungh. 258; Miq. Flor. Ind. Bat. I, 111; Bak. in Flor. Brit. Ind. II, 255. *Poinciana pulcherrima* Linn. Sp. Pl. 380; DC. Prodr. II, 484; Bot. Mag. t. 995; Wall. Cat. 5813; Roxb. Flor. Ind. II, 355; W. & A. Prodr. 282. Rheede, Hort. Malab. VI, t. 1; Rumph. Herb. Amboin. II, t. 20.

A garden or hedge plant in most of our provinces.

The native country of this species is uncertain, but apparently it is not anywhere truly wild in S.-E. Asia. The other species of the section are American, so that this one has perhaps also been originally derived from the Western Hemisphere.

§ 3. Sappania *DC.* *Leaflets* many, membranous, small; *petals* short-clawed; *stamens* not far exserted; *seeds* 3–6.

5. Cæsalpinia Sappan Linn. Sp. Pl. 381. A tree 20–30 feet high with thorny stem 6–10 in. in diam.; branches rusty-pubescent with few small prickles. *Leaves* 8–15 in. long, pinnæ 16–24, 4–6 in. long; leaflets 20–36, close, membranous or chartaceous, oblong, very oblique, sessile, attached at lower corner, apex obtuse or slightly retuse, ·5–·75 in. long, ·35 in. wide, glabrous above, slightly puberulous on the nerves

beneath. *Racemes* in a terminal panicle extending into the axils of the uppermost leaves, 12–16 in. long, 8 in. across, individual racemes 4–6 in. long; pedicels ·5–·6 in. long, bracts lanceolate ·3 in. long, very deciduous. *Calyx* ·4 in. long, leathery, glabrous. *Corolla* ·75 in. across, petals bright-yellow, the upper with a pinkish basal patch, all orbicular subequal. *Stamens* waxy-white, densely woolly at base, declinate. *Ovary* grey-velvety. *Pod* 3–4 in. long, 1·5–2 in. wide, subcompressed, polished, indehiscent, with a hard recurved short beak at upper angle of obtuse apex. Roxb. Cor. Pl. I, 17, t. 16; Hort. Beng. 32; DC. Prodr. II, 482; Wall. Cat. 5838; Roxb. Flor. Ind. II, 357; W. & A. Prodr. 281; Miq. Anal. Ind. I, 9; Flor. Ind. Bat. I, 108; Bedd. Flor. Sylvat. 90; Anal. Gen. t. 13, f. 1; Bak. in Flor. Brit. Ind. II, 255. *Biancæa Sappan* Todaro, Hort. Bot. Panorm. 3. *Lignum Sappan* Rumph. Herb. Amboin. IV, t. 21.

Perak; open jungle at foot of hills, Ulu Bubong, *Kunstler* 10567! Pahang; Pulo Changei, *Ridley* 2590! Distrib. India, Indo-China; Malay Archipelago.

6. Cæsalpinia sepiaria Roxb. Hort. Beng. 32. A moderate climber with stout woody stem and somewhat densely grey- or brown-pubescent branches armed with strong sharp prickles. *Leaves* stipulate, 9–15 in. long; pinnæ 12–20, 2–3 in. long, subequal, leaflets 16–24, very shortly petiolulate, close, membranous, oblong, apex obtuse, base rounded on both sides, slightly oblique on upper, ·5–·8 in. long, rather pale-green glabrous above, glaucous and slightly pubescent beneath; stipules very obliquely ovate with crisped margins, long-acuminate apex, and with projecting auriculate lower angle of base, ·5 in. long, ·3 in. wide, soon deciduous. *Racemes* terminal and axillary all simple, drooping, 6–12 in. long, 2–2·5 in. across, pedicels erecto-patent, ·75 in. long, bracts large ovate-lanceolate caducous, ·4 in. long, densely pubescent. *Calyx* ·5 in. long, densely pubescent. *Corolla* spreading, ·75 in. across, petals bright yellow, all orbicular, ·5 in. across except the upper only ·25 in. in diam. *Stamens* little exserted, declinate, greenish-white, densely woolly in the lower half. *Pod* indehiscent, linear-oblong, 3–5 in. long, 1·2 in. across, sublignose, glabrous, slightly recurved and slightly turgid, rather strongly reticulate-veined especially in the half next lower suture; upper suture dilated into a narrow wing; faces slightly depressed between the 6–8 mottled seeds, ·4 in. long, ·3 in. wide. Wall. Cat. 5834; Roxb. Flor. Ind. II, 360; W. & A. Prodr. 282; Wight, Ic. 37; Miq. Flor. Ind. Bat. I, 109; Bak. in Flor. Brit. Ind. II, 256. *C. ferox* Hassk. Pl. Jav. Rar. 400. *C. japonica* Sieb. & Zucc. Fl. Jap. 9. *C. crista* Thunb. Flor. Jap. 179, not of Linn. *Reichardia decapetala* Roth. Nov. Sp. 9; DC. Prodr. II, 484. *Biancæa scandens* Todaro, Hort. Bot. Panorm. 4, t. 1.

Penang; Govt. Hill, 2500 feet, *Curtis*, 385! Distrib. Eastern and South-Eastern Asia, introduced in America.

7. Cæsalpinia parviflora Prain. A small tree or, at times, a climber, with stem 8–12 in. in diam. and with rusty-pubescent branches sparingly armed with small prickles. *Leaves* stipulate 8–10 in. long, pinnæ 18–24, 2–3 in. long; leaflets 30–36, close, firmly subcoriaceous, oblong, sessile, attached sub-centrally but with the lower corner subauriculately produced, apex obtuse or rounded, ·35–·5 in. long, ·2–·25 in. wide in var. *typica*, ·75 in. long, ·35 in. wide (or rarely even larger) in. var? *stipularis*, dark-green glabrous and shining above, dull beneath and glabrous in var. *typica*, sparsely puberulous on the midrib in var? *stipularis;* stipules lanceolate or oblong ·45–·75 in. long. *Racemes* in an ample terminal again branching panicle extending into the axils of the upper leaves, 2–3 feet long, 12–15 in. across, primary branches 5–8 in. long, final individual racemes 3 in. long; pedicels ·25 in. long, slender, densely puberulous as are the main-rachis and branches of panicle; bracts linear or lanceolate, ·2–·25 in. long, deciduous. *Calyx* ·25 in. long, thinly coriaceous, puberulous. *Corolla* ·3 in. across, petals greenish-yellow, oblong, subequal, hardly exserted. *Stamens* green, densely woolly at base. *Ovary* sparsely pubescent. *Pod* of var. *typica* 1 in. long, ·5 in. wide, with a recurved beak at upper angle of obtuse apex; seeds (young) oval, 4, ·25 in. long.

Var. *typica;* leaflets not exceeding ·5 in. in length, glabrous beneath; stipules lanceolate, ·45 in. long, ·2 in. wide, margin entire; bracts linear, ·2 in. long, hardly equalling the pedicels.

Perak; at low elevations, *Kunstler* 3499! 7584! *Wray* 1909!

Var.? *stipularis;* leaflets ·75 in length or longer, the midrib beneath puberulous; foliaceous stipules broadly ovate-oblong, ·75 in. long, ·35 in. wide, continued in the leafless portion of the more diffusely branching and more densely puberulous inflorescence, their margins often incised; bracts lanceolate, ·25 in. long, equalling the pedicels.

Perak; Larut, in the plains, *Wray* 3983! 3991! 4261!

The foliage of the typical variety of this species is very like that of *C. cinclidocarpa* Miq. or *C. tortuosa* Roxb. but the remarkably small flowers and the different fruit (which is exactly like a minature *C. Sappan* pod) abundantly distinguish it from all other Indo-Malayan species.

The pod of var? *stipularis* is not yet known and it may ultimately be necesary to separate it specifically from *C. parviflora*. But its flowers, except that the calyx is somewhat more puberulous, are exactly as in *C. parviflora*, and though var? *stipularis* has a somewhat different facies on account of its larger leaflets and especially its much longer foliaceous subpersistent stipules, it seems better in the meantime to treat it tentatively as no more than a variety of *C. parviflora*. Wray notes that var. *typica* is a "small tree;" Kunstler states on one occasion that it is

a tree 30–40 feet high, on another that it is a climber 100–150 feet long. Of all three gatherings of VAR. ? *stipularis* it is noted that the plant is a climber.

SUBGEN. 3. CINCLIDOCARPUS Bak. *Pod* rather fleshy, indehiscent, naked on the faces, with thickened sutures. *Petals* broad.

8. CÆSALPINIA DIGYNA Rottl. ex Willd. Nov. Act. Nat. Cur. IV, 198 t. 3. A climber with glabrous or slightly downy branches armed with scattered prickles. *Leaves* 6–9 in. long, pinnæ 8–9, 1·5–2·5 in. long increasing upwards, leaflets 16–20, close, membranous, oblong, obtuse, sessile, base subequally rounded, ·35–·45 in. long, ·25 in. wide, medium-green and glabrous above, greyish and obscurely downy beneath; stipules subulate, membranous, very early deciduous. *Racemes* simple axillary, 8–12 in. long, 3 in. wide, pedicels distant slender horizontal or slightly deflexed, 1 in. long, glabrous as is the main-rachis. *Calyx* leathery, quite glabrous, ·3 in. long. *Corolla* spreading, ·75 in. across, petals orbicular, ·3 in. in diam., subequal, yellow except the upper slightly streaked with red. *Stamens* little exserted, filaments greenish-white, densely woolly in the lower half, declinate. *Pod* rather fleshy, indehiscent, oblong, glabrous, with much thickened sutures, 1·5–2 in. long, 1 in. across, turgid, torulose; seeds 2–4, black, ovoid, ·5 in. long, ·4 in. wide. DC. Prodr. II, 482; Wall. Cat. 5839; W. & A. Prodr. 281; Bak. in Flor. Brit. Ind. II, 256. *C. oleosperma* Roxb. Hort. Beng. 32; Fl. Ind. II, 356. *C. flavicans* Grah. in Wall. Cat. 5825. *C. gracilis* Miq. Flor. Ind. Bat. I, 110. *Pterolobium lacerans* Wall. Cat. 5841 *letters* F, H, and I; not of R. Br.

MALACCA; *Griffith!* PENANG; *Curtis* 448! TONGKAH; *Curtis' Collector* 2862! DISTRIB. India, Indo-China, Malay Archipelago.

9. CÆSALPINIA TORTUOSA Roxb. Hort. Beng. 32. A stout subscandent straggling shrub, with slightly downy spreading branches armed with very strong prickles. *Leaves* 12–18 in. long, pinnæ 30–40, 2·5–4 in. long, the proximal and distal rather shorter than those between, leaflets 40–60, sessile, close, rigidly subcoriaceous, narrowly ligulate, apex obtuse or rounded, base obliquely cuneate, ·25–·3 in. long, ·1 in. wide, dark-green, glabrous on both surfaces, shining above. *Racemes* axillary, simple, erect, 15–18 in. long, 1·5 in. across, pedicels spreading, ·5 in. long, slender, glabrous as is the stout rachis, bracts very small caducous. *Calyx* ·5 in. long, leathery, quite glabrous, the lower segment very deeply cucullate, ·35 in. wide. *Corolla* spreading, ·75 in. across, petals bright-yellow with red streaks near base, all orbicular clawed, ·5 in. across except the upper only ·25 in. in diam. *Stamens* little-exserted, declinate, green, densely woolly in lower half. *Pod* oblong, twisted, indehiscent, glabrous, with much thickened sutures, 2–3 in. long, 1 in. across, turgid, torulose; seeds 2–5, hard, smooth, dark-brown,

·4 in. across. Wall. Cat. 5827, A, B, and C.; Roxb. Flor. Ind. II, 365; Miq. Flor. Ind. Bat. I, 109; Bak. in Flor. Brit. Ind. II, 257.

Penang; Penara Bukit, 700 feet, *Curtis* 1027! Distrib. Sumatra, Tenasserim.

Very nearly related to *C. cinclidocarpa* Miq. which differs by its branching inflorescence and its pubescent calyx; also to *C. acanthobotrya* Miq. which has shorter, more laxly-flowered racemes and broader leaflets. Mr. Kurz indeed has in Herb. Calcutta proposed to treat *C. acanthobotrya* as a variety (var. *latifolia*) of *C. tortuosa* but the examination of an authentic example of Dr. Miquel's plant leads the writer to believe that it is better, at least at present, to consider it specifically distinct.

56. Mezoneuron Desf.

Robust woody prickly climbers. *Leaves* abruptly bipinnate. *Flowers* in ample panicled racemes. *Calyx* very oblique, usually deeply cleft, with a basal or intertubal disc, the lobes imbricated, the lowest largest covering the others in bud like a hood. *Petals* spreading, obovate-spathulate, subequal or the upper smallest. *Stamens* free, declinate, usually exserted; anthers oblong, uniform. *Ovary* sessile or shortly stipitate, declinate, few- or many-ovuled; style filiform, stigma small, capitate, the margin often fringed. *Pod* large, thin, oblong, flat, indehiscent, with a broad wing down the upper suture; seeds compressed, orbicular, cotyledons flat, radicle straight. Species about 15; all in the tropics of Eastern Hemisphere.

Calyx deeply cleft, with a wide short tube and a basal disc, the anterior lobe deeply cucullate (*Eumezoneuron*) :—		
Leaflets opposite, large; pods 1-seeded	1.	*M. cucullatum.*
Leaflets alternate, medium to small; pods several seeded :—		
Leaflets beneath and calyx externally puberulous ...	2.	*M. hymenocarpum.*
Leaflets beneath and calyx externally glabrous :—		
Pedicels puberulous, jointed near base of calyx; leaflets cuneate at apex	3.	*M. Kunstleri.*
Pedicels glabrous, jointed considerably below base of calyx; leaflets obtuse	4.	*M. andamanicum.*
Calyx shallowly cleft, with a narrow long tube and a disc extending above the base, anterior lobe shallowly hooded (*Tubicalyx*); (leaflets alternate)	5.	*M. sumatranum.*

Subgen. 1. Eumezoneuron; calyx deeply cleft, disc basal; lower lobe deeply cucullate.

1. Mezoneuron cucullatum W. & A. Prodr. 283. A large climber, branches glabrous armed with small dark short recurved prickles. *Leaves* 6–12 in. long, pinnæ 4–10, 6–8 in. long; leaflets 8–10, opposite, rigidly subcoriaceous, ovate-acute, base wide-cuneate slightly unequal, 2–4 in. long, 1·25–1·75 in. wide, glabrous on both surfaces, dark-green

above, paler beneath, secondary veins 4–5 pairs and intermediate reticulations faint; petiolules ·2 in. long. *Inflorescence* a terminal or axillary panicle of simple or occasionally branched racemes, 1–1·5 feet long, with terete glabrous main-rachis; single racemes 4–8 in. long; pedicels close-set, slender, ·3 in. long, jointed a little above the middle. *Calyx* yellow, quite glabrous, leathery, anterior sepal cucullate, obtuse, ·25 in. long, the rest orbicular, tube shallow. *Corolla* ·45 in. across, pale-green, standard 2-lobed, shorter but wider than the other subequal orbicular 4. *Stamens* far exserted, puberulous at base, declinate, unequal. *Ovary* declinate, 1–2-ovuled. *Pod* thin, 3–3·5 in. long, 1·25 in. wide (including wing ·3 in. wide), faintly reticulated; seeds usually solitary, very rarely 2.

Andamans; common. Distrib. Eastern Himalaya, India, Indo-China.

2. Mezoneuron hymenocarpum W. & A. Prodr. I, 283. A large climber, branches finely puberulous, with a few scattered recurved brown prickles. *Leaves* 1–1·5 feet long, pinnæ 1–10, 3–4 in. long, leaflets 10–14, alternate or subopposite, rigidly subcoriaceous, obovate, apex obtuse or rounded, base cuneate unequal, ·5–1 in. long, ·25–·6 in. wide, puberulous above, puberulous to densely pubescent beneath, secondary veins 5–6 pairs very faint; petiolules ·15 in. long. *Inflorescence* a large terminal thyrsoid panicle of unbranched racemes extending into the axils of the uppermost leaves, 2 feet long, 8–10 in. wide, the single racemes 6–8 in. long, puberulous as are the main-rachis and slender pedicels, ·35–·5 in. long, jointed ·15 in. under base of calyx. *Calyx* densely puberulous, leathery, anterior sepal cucullate subacute, ·25 in. long, the others orbicular. *Corolla* ·5 in. across, yellow, petals ovate-orbicular, upper small. *Stamens* far exserted, hirsute at base, declinate, unequal. *Ovary* declinate, about 5-ovuled; stigma slightly fringed. *Pod* thin, 4 in. long, when ripe 1 in. wide (including posterior wing ·25–·3 in wide), faintly wide-reticulated, 5-seeded. *Cæsalpinia hymenocarpa* Wall. Cat. 5832. *Mezoneuron pubescens* Bak. in Flor. Brit. Ind. II, 259 not of Desf.

Andamans; very plentiful near Port Blair, *King's Collectors!* Distrib. Burma; Ceylon.

Resembles *M. andamanicum* but is easily distinguished by its leaves and its calyx being pubescent; by its pedicels being shorter; and by its pods being smaller and not so distinctly reticulated.

3. Mezoneuron Kunstleri Prain. A large climber, branches glabrous, with a few brown scattered recurved prickles. *Leaves* 6–8 in. long, pinnæ 4–6, 4–5 in. long, leaflets 6–8, alternate, subcoriaceous, ovate, cuneate at apex and base, almost equally decurrent on the short petiolule,

·5–1·25 in. long, ·35–·75 in. wide, glabrous on both surfaces, dark-green above, glaucescent beneath, secondary veins few, faint, widely reticulated; petiolules ·15 in. long. *Inflorescence* a large terminal thyrsoid panicle of unbranched racemes 1·5–2 feet long, 8–9 in. wide, the single racemes 8–10 in. long, faintly puberulous as in the main-rachis; pedicels slender ·35–·45 in. long, distinctly puberulous, jointed ·2 in. under base of calyx. *Calyx* quite glabrous, leathery, anterior sepal deeply cucullate obtuse, ·25 in. long, the rest orbicular, all gland-dotted as is the shallow tube. *Corolla* ·5 in. across, bright-yellow, petals ovate-orbicular, upper smaller than the others. *Stamens* far exserted, hirsute at base, declinate, unequal. *Ovary* declinate, about 5-ovuled; stigma slightly fringed. *Pod* only seen very young; wing half as wide as body of pod.

Perak; Sungah Ryah, *Kunstler* 895!

A species very near *M. andamanicum*, with which it agrees in number, size, and disposition of leaflets, and which it closely resembles in flowers. The different shape of the leaflets, however, and especially the much shorter distance between the joint in the pedicel and the base of the calyx, with the much shorter puberulous pedicels, mark it as abundantly distinct. The wing, too, of the very young pod is in *M. Kunstleri* almost twice as wide as the wing in the corresponding stage of the pod in *M. andamanicum*.

4. Mezoneuron andamanicum Prain, Journ. As. Soc. Beng. LXI, 2. 131. A large climber, branches glabrous with a few scattered prickles. *Leaves* 1–1·5 feet long, pinnæ 4–10, 5–7 in. long, leaflets 8–10, alternate, rigidly subcoriaceous, obovate, slightly retuse, base cuneate slightly unequally decurrent on the short petiolule, ·5–1·5 in. long, ·35–1 in. wide, glabrous on both surfaces, dark-green above, pale beneath, secondary veins few faint widely reticulated; petiolules ·15 in. long. *Inflorescence* a large terminal thyrsoid panicle of unbranched racemes extending into the axils of the uppermost leaves, 2–2·5 feet long, 1 foot wide, the single racemes 10–12 in. long, quite glabrous as are the main-rachis and the slender pedicels ·5–·75 in. long, jointed ·3 in. under base of calyx. *Calyx* quite glabrous, leathery, anterior sepal deeply cucullate obtuse, ·25 in. long, the rest orbicular all reticulate-veined and yellow gland-dotted as is the shallow tube. *Corolla* ·5 in. across, rather pale-yellow, petals ovate-orbicular, the upper smaller than the others with a thickened claw prolonged into a ligular ciliate ridge, the rest with claw hirsute internally and with lamina red-blotched at base and pink-veined. *Stamens* far exserted, hirsute at base, declinate, 2-seriate, free, unequal. *Ovary* declinate, ovules about 6; stigma slightly fringed. *Pod* thin, 5 in. long, when ripe 1–1·5 in. wide (including posterior wing ·25–·35 in. wide), finely wide-reticulated, distantly 3–5-seeded.

Andamans; very common near Port Blair, *Prain! Man! King's Collector!*

Subgen. 2. Tubicalyx Miq. Flor. Ind. Bat. I, 1081. *Calyx* shallowly cleft, the disc extending above the base, lower lobe shallow-cucullate.

5. Mezoneuron sumatranum W. & A. Prodr. I, 283. A large climber, branches glabrous, armed with a few dark short recurved prickles. *Leaves* 1–1·5 feet long, pinnæ 6–10, 8–12 in. long, leaflets 6–8, alternate, rigidly subcoriaceous, obovate-oblong, emarginate and apiculate, base rounded very slightly unequal, 1·5–2·5 in. long, 1·25–1·75 in. wide, glabrous on both surfaces, dark-green above, paler beneath, secondary veins rather prominently closely reticulate beneath; petiolules ·2 in. long. *Inflorescence* a terminal or axillary panicle of simple or occasionally branched racemes 1·5–2 feet long, with terete thick glabrous main rachis, single racemes 5–6 in. long; pedicels close-set slender, ·25 long, curved. *Calyx* quite glabrous, leathery, anterior sepal orbicular ·25 in. long, twice as large as the others, tube compressed ·5 in. long. *Corolla* ·35 in. wide, ·5 in. long, of 5 subequal petals, oblong, narrowed to the base, the standard reddish the other petals yellowish. *Stamens* hardly exserted, declinate, glabrous, unequal. *Ovary* declinate stipitate glabrous, 3–4-ovuled, stigma glabrous. *Pod* thin, 3–4 in. long, 1·35 in. wide (including posterior wing ·25 in. wide), finely wide-reticulate, distantly 3–4-seeded. Miq. Flor. Ind. Bat. I, 105 and I, 1081; Bak. in Flor. Brit. Ind. II, 259. *Cæsalpinia sumatrana* Roxb. Hort. Beng. 32; Flor. Ind. II, 356; Wall. Cat. 5831A only.

Malacca; *Griffith! Maingay* 534! Perak; Thaipeng, *Scortechini* 67! Kwala, *Scortechini* 1766! Simpat, *Ridley* 3083! Dindings; Lumot, *Ridley & Curtis!* Singapore; near Krangi, *Ridley* 2105! 6026!

The great difference in the appearance of the calyx no doubt justifies Dr. Miquel's proposal to treat this plant as the type of a distinct subgenus of *Mezoneuron*.

57. Pterolobium R. Br.

Robust woody prickly climbers. *Leaves* abruptly bipinnate. *Flowers* in panicled racemes. *Calyx* deeply cleft, with the disc near the base, the lobes imbricated, the lowest longer and more hooded than the others. *Petals* spreading, oblong and clawed equalling the calyx. *Stamens* 10, free, declinate, little exserted; anthers oblong versatile. *Ovary* sessile, 1-ovuled; style filiform, stigma small terminal. *Pod* indehiscent, samaroid with a large horny oblique terminal wing. Species 7; one African, one Australian, two Chinese, three South-East Asiatic.

Racemes with thin angular glabrous rachis, laxly 20–30-fld., pedicels longer than calyx	1. *P. macropterum.*
Racemes with stout terete puberulous rachis, densely 150–200-fld.; pedicels not longer them calyx	2. *P. densiflorum.*

1. Pterolobium macropterum Kurz, Journ. As. Soc. Beng. XLII, 2. 71. A large climber, young branches sparsely pubescent, all parts

sparingly armed with small prickles. *Leaves* 6–9 in. long; pinnæ 14–16, 2–2·5 in long with puberulous rachis; leaflets 14–20, elliptic-oblong, apex rounded or obtuse, base unequal, abruptly rounded on upper, narrow-cuneate on lower side, ·45 in. long, ·25 in. wide, chartaceous, dark-green above, paler beneath, glabrous on both surfaces. *Racemes* lax, in spreading terminal and axillary panicles with glabrous slender angular rachis and branches, 8 in. long, 4 in. across, individual racemes 3–4 in. long, 20–30-fld.; pedicels glabrous slender spreading, ·4–·6 in. long. *Calyx* glabrous, thinly coriaceous, lowest sepal ·25 in. long. *Corolla* white, ·25 in. long. *Pod* 2·5–2·75 in. long, glabrous; seed-bearing base turgid reticulate, ·75 in. long, ·5 in. wide, wing ·7–·8 in. wide, the upper margin straight or slightly recurved thickened, the lower thin irregularly sinuately convex, the apex rounded. *Pterolobium lacerans* Miq. Flor. Ind. Bat. I, 106 not of R. Br., nor of Wall., nor of Wight. *P. indicum* VAR. *macropterum* Bak. in Flor. Brit. Ind. II, 259.

ANDAMANS; very common. DISTRIB. JAVA; Burma.

This species is not so closely related to *P. lacerans* R. Br., with which Dr. Miquel has identified it, as it is to *P. indicum* A. Rich. (*P. lacerans* Wall.; W. & A.; Wight, Ic.) of which Mr. Baker treats it as a variety. *P. macropterum* has however quite glabrous flower branches, very different leaflets, and fewer and smaller prickles; while it agees with *P. indicum* in length of pedicels and in style of inflorescence, it has very different pods with a much larger wing.

2. PTEROLOBIUM DENSIFLORUM Prain. A large climber, young branches pubescent, all parts very strongly armed with large recurved prickles. *Leaves* 4–8 in. long, pinnæ 8–16, 3 in. long, with puberulous rachis; leaflets 14–16, rather narrow-oblong, apex obtuse or retuse, base unequal abruptly rounded on both sides, ·6 in. long, ·25 in wide, subcoriaceous, dark-green, glabrous on both surfaces. *Racemes* dense in fastigiate terminal panicles with stout subterete puberulous rachis and branches; 1·5 feet long, 1 foot across, individual racemes 150–200-fld., 6–8 in. long; pedicels puberulous slender spreading, ·25 in. long. *Calyx* sparsely puberulous, thinly coriaceous, lowest sepal ·3 in. long. *Corolla* yellow, ·3 in. long. *Pod* 2 in. long, glabrous; seed-bearing base turgid, reticulate, ·6 in. long, ·5 in. wide, wing ·5–·7 in. wide, the upper margin straight thickened, the lower thin irregularly sinuately convex, the apex narrowly rounded. *P. microphyllum* Kurz, Journ. As. Soc. Beng. XLII, 2, 71 not of Miq. *P. indicum* VAR. *microphyllum* Bak. in Flor. Brit. Ind. II, 259 in part, and excl. the plant of Miquel.

PENANG; Government Hill, 2500 feet, *Curtis* 3093! MALACCA; *Maingay* 535!

Maingay's plant here cited is the same as that of Curtis both as regards flowers and fruits. The description of the leaflets is taken from the Penang plant, the Malacca one at Calcutta having only bare rachises. The Malacca plant is the type

of *P. microphyllum* Kurz; that it cannot possibly be the true *P. microphyllum* Miq. is obvious from the fact that Miquel's plant has linear leaflets smaller than those of his *P. lacerans*—which is the *P. macropterum* of this work—arranged in from 20–22 pairs on 14–16 pairs of pinnæ, whereas *P. densiflorum* has oblong leaflets larger than those of *P. macropterum*, arranged in from only 7–8 pairs on 4–8 pairs of pinnæ. Mr. Kurz's misidentification no doubt arose from the fact that he had not seen the leaves of Maingay's plant. In style of inflorescence *P. densiflorum* most resembles the Chinese *P. punctatum* Hemsl., but that plant has less dense and less numerously flowered racemes, and has very different leaves.

Suborder III. Mimoseæ.

Trees, shrubs or very rarely herbs. *Leaves* 2-pinnate, very rarely simply pinnate. *Flowers* small, rarely elongated, tubular, sessile in globose heads or cylindric spikes, rarely shortly pedicelled and in globose umbels or slender racemes; bracts small narrow often dilated at the tips, substrobilately imbricate in bud usually deciduous during flowering; bracteoles very rare; perianth regular often in 5-merous, sometimes 4-merous, rarely 3-merous or 6-merous whorls. *Sepals* valvate (except in *Parkieæ*), rarely free, usually connate in a 5-toothed to 5-lobed tube, sometimes 0; disc-tube 0. *Petals* as many as sepals, valvate, free or connate in a lobed tube, hypogynous or obscurely perigynous. *Stamens* as many, or twice or thrice as many, as petals, or indefinite, free or monadelphous, or adnate to base of corolla tube, usually exserted; anthers small, versatile, dehiscing longitudinally. *Ovary* free at base of calyx. *Seeds* usually ovate or orbicular, compressed, with basilar hilum; rarely thick globose or ovoid; testa hard, albumen 0, or scanty; cotyledons flat; radicle straight, shortly exserted or included; funiculus often expanded in a small fleshy arillus.

Anthers gland-tipped; (stamens 5–10):—
- Calyx-teeth short, imbricated (*Parkieæ*); filaments usually either connate or adnate at base; (inflorescence capitate; heads very large; trees) ... ... 58. Parkia.
- Calyx valvate (*Adenantheræ*); filaments free:—
  - Inflorescence elongated; (species all woody):—
    - Flowers sessile; great climbers with opposite leaflets and huge pods and seeds ... ... 59. Entada.
    - Flowers short-stalked; trees with alternate leaflets and narrow contorted pods ... ... 60. Adenanthera.
  - Inflorescence capitate; heads small:—
    - Small aquatic or subaquatic herbs with small thin pods opening early by upper suture; seeds small ... 61. Neptunia.
    - Lofty trees with large thick woody pods, late in dehiscing, opening by both sutures; seeds large ... 62. Xylia.

Anthers not gland-tipped; (calyx valvate, rarely 0):—
- Filaments free:—
  - Stamens definite, as many, or twice as many as petals

(*Eumimoseæ*); (inflorescence capitate in Malayan species); shrubs or under-shrubs with thin coriaceous pods:—

Pods straight with continuous valves, dehiscing through sutures ... ... 63. LEUCÆNA.

Pods slightly curved with usually segmented valves and with always indehiscent persistent sutures ... 64. MIMOSA.

Stamens indefinite often very numerous (*Acacieæ*); inflorescence spicate or capitate ... ... 66. ACACIA.

Filaments more or less connate (*Ingeæ*); (stamens usually indefinite, rarely only 2–3-times as many as petals):—

Pods (indehiscent) septate between the seeds:—

Flowers large; petals adnate below to the staminal tube, otherwise free; pod woody turgid, sutures not thickened ... ... 66. SERIANTHES.

Flowers small; petals connate below in a tube; pod spongy or fleshy hardly turgid, the sutures thickened 67. ENTEROLOBIUM.

Pods not septate between the seeds:—

Pods straight with thin valves:—

Sutures thickened; valves elastically revolutely dehiscent from apex to base ... 68. CALLIANDRA.

Sutures thin, pods indehiscent or if dehiscent the dehiscence not elastic ... ... 69. ALBIZZIA.

Pods twisted with coriaceous valves, or if almost straight (*P. bubalinum*) with fleshy valves, (sutures thin) ... ... 70. PITHECOLOBIUM.

58. PARKIA R. Br.

Tall, unarmed trees. *Leaves* bipinnate with usually very numerous leaflets. *Flowers* in dense long-peduncled heads, each subtended by a coriaceous persistent ligulate bract with a spoon-shaped tip. *Calyx* tubular, shortly 5-cleft, lobes imbricate. *Corolla* tubular, cleft half-way down, the segments subvalvate. *Stamens* 10, exserted, the filiform filaments united in the lower part with each other and with the corolla-tube; anthers narrow, gland-tipped, the pollen cohering in irregular masses. *Ovary* stalked, many-ovuled; style filiform, stigma minute capitate. *Pod* large, flat, strap-shaped, coriaceous, finally dehiscing. Species about 10, cosmopolitan in the tropics, mostly American.

Petioles with two glands; heads subspherical (leaflets very narrow, acute, in 60–100 pairs) ... ... 1. *P. biglandulosa.*

Petioles with one gland only; heads turbinate or clavate:—

Leaflets subfalcate, acute, in 40–80 pairs ... ... 2. *P. Roxburghii.*

Leaflets straight, obtuse or retuse in 20–35 pairs ... 3. *P. speciosa.*

1. PARKIA BIGLANDULOSA W. & A. Prodr. 279. A lofty tree. *Leaves* 2-pinnate, main-rachis downy 12–15 in. long; pinnæ 20–40 pairs subalternate, secondary rachises also downy about 3 in. long; leaflets

small straight narrow linear-ligulate close-set, 60–100 pairs, with obliquely truncate bases and acute apices, strongly 1-nerved, pubescent along the margins, ·2 in. long, ·05 in. across, petiolar part of main rachis 1–1·5 in. long, with 2 collateral glands at the top of its swollen base, and with 3–9 solitary glands between the bases of as many pairs of pinnæ toward the apex of the rachis. *Flowers* in dense subspherical heads 1·5 in. in diam., peduncle 4–9 in. long. *Calyx* tubular, shortly 5-cleft, ·3 in. long, teeth pilose, elsewhere glabrous. *Corolla* tubular, segments subvalvate. *Stamens* 10, exserted, the filaments connate below and adnate at base to corolla tube; anthers narrow. *Pod* (including stipe 2 in. long) 14–15 in. long, 1·5 in. wide, ·35 in. thick, black, at first downy, ultimately quite glabrous. *Seeds* 10–12, oval, ·75 in. long, ·5 in. wide, ·25 in. thick, dark-brown, smooth with a central ovate-lanceolate pale-brown rugose area. Bak. in Flor. Brit. Ind. II. 289. *Mimosa pedunculata* Roxb. Fl. Ind. II, 551.

Malay Peninsula; *fide* Baker.

Mr. Baker says that this comes from the Malay Peninsula, and on his authority the statement is here repeated. No botanist has, however, hitherto sent it from the Malay Peninsula; the locality given by Roxburgh is not Malaya, but "the islands to the, eastward of the Bay of Bengal;" by this Roxburgh indicates the Andamans and Nicobars. Still, no one has gathered it there in recent years, and the precise habitat must for the present be left doubtful. The specimens at Calcutta are (1) Wight's n. 559, the type of the species, cult. in the Missionary Garden; (2) Specimens from Madras Agri.-Hort. Society's Garden collected by Dr. Cleghorn; (3) Specimens of Roxburgh's plant from the Calcutta Botanic Garden where the tree still grows—these last are exactly like Wight n. 559 and show that the doubts expressed by Wight and Arnott as to the indentity of their plant with Roxbugh's *Mimosa pedunculata* are unfounded; (4) Specimens, no doubt from cultivated examples, sent from Assam by Masters and by Jenkins. This is the only *Parkia* at all generally cultivated in Bengal; the next species, which is also grown, is comparatively uncommon.

P. biglandulosa should then be carefully looked for in the Nicobars and Andamans, and particularly in N. Andaman; it is highly improbable that it will be found, in a wild state, either in Indo-China or in Malaya.

2. Parkia Roxburghii G. Don, Gen. Syst. II, 397. An erect tree 40–60 feet high, stem about 2 feet in diam., young branches pubescent. *Leaves* 2-pinnate, main-rachis puberulous or glabrescent, 12–24 in. long; pinnæ 20–30 pairs, opposite; secondary rachises glabrescent 3–6 in. long; leaflets small, falcately curved forwards, linear-lanceolate, close-set, 40–80 pairs, subequally truncate at base, apex acute, strongly 1-nerved, puberulous along the margins, ·3 in. long, ·1 in. wide, petiolar part of main-rachis 2–3 in. long with 1 solitary gland below the lower pair of pinnæ and with 3–5 solitary glands between the bases of as many pairs of pinnæ towards apex of rachis. *Flowers* in dense turbi-

nate heads, 1·5 in. long, 1 in. in diam., peduncle 10–16 in. long. *Calyx* tubular, shortly 5-cleft, ·25 in. long, teeth pilose, elsewhere glabrous. *Corolla* tubular, pale-yellow, segments subvalvate. *Stamens* 10, exserted, the filaments connate below and adnate to corolla-tube; anthers narrow. *Pod* (including stipe 3–7 in. long) 15–20 in. long, 1·5 in. wide, ·3 in. thick, black, glabrous. *Seeds* 12–20, oval, ·5 in. long, ·35 in. wide, ·2 in. thick, dark-brown and smooth throughout. Bak. Flor. Brit. Ind. II, 289. *P. Brunonis* Grah. in Wall. Cat. 5288. *P. africana* Miq. Flor. Ind. Bat. I, 52 not of R. Br. *P. biglobosa* Benth. in Hook. Journ. IV, 328; Miq. Flor. Ind. Bat. Suppl. 283; Koord. & Val. Bijdr. I, 276. *P. intermedia* Hassk. Cat. Hort. Bog. 289; Pl. Jav. Rar. 414. *Mimosa biglobosa* Roxb. Flor. Brit. Ind. II, 551 not of Jacq.

Singapore; cultivated, *Ridley* 6928! Malacca; Panchor, *Goodenough* 1748! Distrib. Wild in Silhet, Cachar and Chittagong; cultivated sparingly in Indo-China and Malaya.

Mr. Goodenough gives the native name as "*Kada-ong*;" the seeds, he notes, are used as peppermint. This species is said by Koorders and Valeton to be wild in Java; the species cultivated by the Javanese is not, however, the present one, but the next, *P. speciosa* Hassk. And it should be noted besides that the wild tree in Java is *not exactly* the tree that is wild in Silhet, Cachar and Chittagong but is the form that Hasskarl proposed to treat as a distinct species under the name *P. intermedia*. Mr. Ridley's specimens, from the Singapore Gardens, are precisely like those from Cachar and Chittagong (true *P. Roxburghii*); Mr. Goodenough's, on the other had, are absolutely identical with those from Java (true *P. intermedia*). Before definitely deciding that *P. intermedia* and *P. Roxburghii* are the same species, the writer would wish to study the former in the living state; it is often a rash thing to reduce to another, from herbarium material alone, species founded by so competent a botanist as Hasskarl; so far as our Calcutta specimens go, the evidence is altogether in favour of these two trees being quite distinct.

3. Parkia speciosa Hassk. Flora XXV. Beibl. 55. A large tree with spreading branches, 80–100 feet high, stem 2–3 feet in diam., young branches glabrescent. *Leaves* 2-pinnate, main-rachis pubescent, 8–10 in. long; pinnæ 10–16 pairs, subalternate, secondary rachises puberulous, 3 in. long; leaflets small almost straight, linear, close-set, 20–35 pairs, subequally truncate at base, obtuse or retuse at apex, ·25 in. long, ·1 in wide, with strong median and 3–4 pairs of distinct secondary nerves beneath, margins with only a few scattered hairs; petiolar part of main-rachis 1–1·5 in. long, with 1 solitary gland midway between base and lowest pair of leaflets and with 2–6 solitary glands between the bases of as many pairs of pinnæ towards apex of rachis. *Flowers* in dense narrowly clavate heads, 2 in. long, ·75 in. in diam., peduncles slender 16–20 in. long. *Calyx* tubular, shortly 5-cleft, ·25 in. long, teeth pilose, elsewhere glabrous. *Corolla* tubular, white, segments subvalvate. *Stamens* 10, exserted, the filaments connate below and adnate to corolla-tube; anthers

narrow. *Pod* (including stalk 2–5 in. long) 18–20 in. long, 2–2·5 in. wide, ·3 in. thick, black, glabrous. *Seeds* 12–18, oblong-oval, ·9 in. long, ·6 in. wide, ·25 in. thick, dark-brown and smooth throughout. Hassk. Cat. Hort. Bog. 289; Pl. Jav. Rar. 414; Miq. Flor. Ind. Bat. I, 53. *P. macrocarpa* Miq. Flor. Ind. Bat. Suppl. 284. *Acacia graveolens* Jack, Mal. Misc. II, 78. The Pete or Pethek.

Penang; on the coast, cultivated, *Curtis!* Prov. Wellesley; *Kunstler* 1657! Perak; Thaiping, *Scortechini* 504! Larut, in dense jungle from 500–2000 feet elev., local, *Kunstler* 5300! Distrib. Sumatra; Java, (cult. *Hasskarl!*).

It would appear that this is the only species of *Parkia* truly wild in our area. It has been identified by Father Scortechini with *P. macrocarpa* Miq., from Sumatra, of which there is no authentic specimen at Calcutta; it certainly accords admirably with Miquel's description. There is at Calcutta an authentic example of Hasskarl's *P. speciosa*; it proves that the present species is no other than Hasskarl's plant, and as Hasskarl's name has nearly twenty years' priority it is here adopted. In the *Index Kewensis* it is suggested that both *P. intermedia* and *P. speciosa* may be forms of *P. Roxburghii*. To judge by Hasskarl's description this *may* be true of *P. intermedia*; as regards *P. speciosa* the suggestion is obviously an impossible one.

While however, Hasskarl's name *P. speciosa* is long anterior to Miquel's, it does not conserve the oldest specific name. This tree is, as Hasskarl expressly admits, (*Neuer Schluess.* 50) the *Pete* of Rumphius (*Herb. Amb.* III, 51); it is equally the *Petek* of Jack, to which Jack has given the name *Acacia graveolens*. The writer does not propose, in the modern manner, to suggest that *P. speciosa* should therefore be known as *Parkia graveolens*, though doubtless there are those who will seize the opportunity of applying this name and of posing as authorities for the species.

It is strange that though evidently wild so near as in Sumatra and in the Malay Peninsula, this species is only cultivated in Java, and that there, according to Koorders and Valeton, its native country is unknown. These authors indeed (*Bijdr.* I, 268) suggest that it is a native of British India. It certainly is not a native of India proper; it is not even cultivated there. Our Indian species are, *P. Roxburghii* (*P. biglobosa*), wild in Silhet, Cachar and Chittagong; *P. leiophylla*, wild in Pegu; and *P. insignis*, wild in Martaban. We in India also experience a difficulty like that experienced by our Dutch colleagues, since there is a species *P. biglandulosa*, cultivated in India from Madras to Assam, of whose natural habitat we are somewhat uncertain.

59. Entada Adans.

Woody unarmed climbers, with tendrils. *Leaves* bipinnate. *Flowers* in long narrow spikes, minute, yellowish, polygamous. *Calyx* minute, campanulate, equally 5-toothed. *Corolla* oblong in bud, the 5 long equal narrow lobes falcate in expansion. *Stamens* 10, free, shortly exserted, filaments filiform; anthers crowned with a gland. *Ovary* subsessile, many-ovuled; style filiform, stigma concave terminal. *Pod* flat, woody, very large, composed of many discoid one-seeded joints,

the endocarp persisting round the large compressed orbicular seeds. Species 10, the others Trop. African and American.

ENTADA SCANDENS Benth. in Hook. Journ. Bot. IV. 332. A very large slender creeper; branches woody terete glabrous. *Leaves* with petiole 2–4 in. long, the rachis as long or longer ending usually in a tendril; pinnæ usually 4 with stalks 1·5–2·5 in. long, leaflets oblong or obovate, obtuse or acute, 1–2 in. long, ·6–1·25 in. wide, glabrous, dark-green, rigidly coriaceous, shining above; petiolules ·1 in. *Inflorescence* of peduncled spikes, 6–10 in. long, usually panicled from the nodes of old leafless branches, sometimes simple from the axils of the leaves. *Flowers* ·1–·15 in. long, sessile or very shortly pedicellate. *Calyx* green, 5-toothed, teeth valvate. *Corolla* yellow. *Pod* 1–3 feet long, 3–4 in. wide, 1·5 in. thick, slightly curved, sutures very thick indented between seeds, valves woody depressed sublineate between the seeds, with a tendency to segmentation. *Seeds* 5–15, oblong, somewhat flattened, 2 in. long, 2·25 in. wide, 1·25 in. thick, testa very dark-brown, thick tough polished, slightly oily. Brand. For. Flor. 167; Bak. in Flor. Brit. Ind. II, 287. *E. Pursætha* DC. Prodr. II, 425; Wall. Cat. 5294; W. & A. Prodr. 267; Miq. Flor. Ind. Bat. I, 45; Scheff. in Nat. Tijds. Ned. Ind. XXXII. 412 t. 16, t. 18A. *E. monostachya* DC. Prodr. II, 425; Wall. Cat. 5293. *E. Rheedei* Spreng. Syst. II, 325. *E. Parrana* Spreng. Syst. II, 325. *E. Rumphii* Scheff. Nat. Tijds. Ned. Ind. XXXII, 412 t. 17, t. 18B. *Mimosa scandens* Linn. Sp. Pl. ed. II. 1501; Roxb. Flor. Ind. 554. Rumph. Herb. Amboin. V. 5. t. 4; Rheede, Hort. Malab. VIII. t. 32, 33, 34; IX, t. 77.

ANDAMANS; very common on the coasts. NICOBARS: *Kurz!* COCO GROUP; *Prain!* NARCONDAM; *Prain!* PENANG; *Porter* (Wall. Cat. 5293)! *Curtis* 115! MALACCA; *Hervey! Derry!* PERAK; *Scortechini* 769! *Kunstler* 1018! 6228! *Wray* 1676! 1715! 2866! DISTRIB. Tropics generally.

Rather variable as to number and size of leaflets; both the forms figured by Scheffer occur in our area. That which he terms *E. Rumphii* is much the commoner in the Malay Peninsula: from the Andamans and Nicobars only the form *E. Pursætha* is reported.

60. ADENANTHERA Linn.

Erect trees without spines or tendrils. *Leaves* ample, bipinnate. *Flowers* minute, in narrow spike-like racemes, hermaphrodite, usually pentamerous. *Calyx* campanulate, equally toothed. *Petals* valvate, equal, lanceolate, cohering only at the very base. *Stamens* 10, free, equalling the corolla; anthers tipped with a gland. *Ovary* sessile, many-ovuled; style filiform, stigma minute capitate. *Pod* strap-shaped, torulose, falcate, the coriaceous valves much twisted after they separate.

Seeds small, bright-coloured. Species 4, spread through tropics of Old World.

Leaflets obtuse glabrous beneath ; pinnæ 8–12	1. *A. pavonina.*
Leaflets acute puberulous beneath ; pinnæ 6–8	2. *A. bicolor.*

1. Adenanthera pavonina Linn. Sp. Pl. 384. A small unarmed tree 20–50 feet high. *Leaves* with a petiole 2–4 in. long, rachis prolonged 6–10 in. not produced beyond last pair of pinnæ ; pinnæ 8–12 opposite, 3–6 in. long with stalk ·5–·75 in. long ; leaflets alternate 10–16, ovate or oblong, base wide-cuneate, apex obtuse, papery, ·5–1·5 in. long, ·3–·75 in. wide, dark-green above, pale glaucous beneath, glabrous on both surfaces ; petiolule ·15 in. long. *Inflorescence* of narrow short-peduncled racemes 2–6 in. long, axillary or panicled at the ends of branches. *Flowers* small, ·15 in. long, on slender pedicels also ·15 in. long. *Calyx* green, lobes very small. *Corolla* pale-yellow, the petals equal, valvate, narrow-lanceolate, free except at the base, glabrous. *Stamens* 10, free, hardly exserted, anthers tipped by a gland. *Pod* flat, 6–9 in. long, ·6 in. wide, ·3 in. thick, contorted when ripe. *Seeds* 10–15, lenticular, ·35 in. in diam., ·25 in. thick, with a smooth, shining, usually uniformly red testa. DC. Prodr. II, 446 ; Roxb. Flor. Ind. II, 370 ; Wall. Cat. 5300 ; W. & A. Prodr. 271 ; Wight, Ill. t. 80 ; Bedd. Fl. Sylvat. t. 46 ; Miq. Flor. Ind. Bat. I, 46 ; Bak. in Flor. Brit. Ind. II, 287.

Andamans ; very common. Perak ; Thaiping, *Scortechini* 80 ! Inatang Jambu, *Wray* 2515 ! Kedah ; Langkawi, *Curtis !* Tongkah ; *Curtis' Collector* 3091 ! Malacca ; *Griffith !* Distrib. Widespread in South-Eastern Asia.

2. Adenanthera bicolor Moon, Cat. Pl. Ceyl. 34. A small slender unarmed tree 20–30 feet high. *Leaves* with a petiole 1·5–2·5 in. long, rachis prolonged 3–5 in., not produced beyond last pair of pinnæ ; pinnæ 6–8 opposite, 2·5–4 in. long with stalk ·3 in. long ; leaflets alternate 8–10, ovate or elliptic, base rounded, apex acute, rigidly subcoriaceous, ·75–1·5 in. long, ·5–·75 in. wide, bright-green glabrous above, pale-glaucous adpressed-puberulous beneath ; petiolule ·15 in. long. *Inflorescence* of narrow short-peduncled racemes 3–5 in. long, axillary or panicled at the ends of branches. *Flowers* small, ·15 in. long, on slender pedicels also ·15 in. long. *Calyx* green, lobes very small. *Corolla* white, the petals equal, valvate, elliptic-lanceolate, free except at the very base, glabrous. *Stamens* 10, free, distinctly shortly exserted, anthers tipped by a stipitate gland. *Ovary* glabrous reddish. *Pod* flat, 4–6 in. long, ·6 in. wide, ·3 in. thick, contorted when ripe. *Seeds* 8–10, lenticular, ·35 in. in diam., ·25 in. thick, with a smooth shining red, or black and red testa. Thwaites Enum. Pl. Zeyl. 98 ; Bedd. Flor. Sylvat. 94 ; Bak. in Flor. Brit. Ind. II, 287.

Penang; Waterfall, *Curtis* 2840! *King!* Perak; Larut, *Kunstler* 3991! *Scortechini* 197! 1849! Assam Kumbong *Wray* 2124! Pankore; *Scortechini* 1073! Singapore; Bukit Timah, *Hullett* 880! Bukit Mandai, *Ridley* 3636 A! Malacca; *Miller! Griffith! Maingay* 591! *Derry* 522!

The seeds are not always black and red but are sometimes concolorous red just as is usual in *A. pavonina*. The nearest ally of this species is one obtained in Borneo by Mr. Hullett. This Mr. Hullett notes as "a good-sized tree," from Sarawak (*Hullett* 292); Mr. Brace in the Calcutta Herbarium has named it *A. borneensis* Brace. The diagnosis between the two species may be given as follows:—

Pinnæ 3–4 pairs; leaflets 8–10, acute at apex, always under 2 in. long, 1·5 times as long as broad, pale-green above, glaucous and puberulous beneath; flowers not longer than pedicels	1. *A. bicolor.*
Pinnæ 2 pairs; leaflets 4–5, acuminate at apex, usually over 2 in. long, twice as long as broad, dark-green above, glabrous and not glaucous beneath; flowers twice as long as pedicels...	2. *A. borneensis.*

The flowers of *A. borneensis* are considerably larger than those of *A. bicolor*.

Dr. Griffith has noted that the Malay name of *A. bicolor* in Malacca is "*Bunah Saga;*" Mr. Derry gives it as "*Saga.*"

61. Neptunia Lour.

Herbs without prickles. *Leaves* bipinnate, with persistent stipules and numerous small strap-shaped sensitive membranous leaflets. *Flowers* minute, dimorphous, in dense heads on axillary peduncles, polygamous, those of the lower part of the head bearing only protruded flattened staminodia. *Calyx* minute, campanulate, 5-toothed. *Petals* 5, strap-shaped, connate near the base. *Stamens* of the perfect flowers exserted; anthers gland-crested. *Ovary* stalked, many-ovuled; style filiform, stigma club-shaped. *Pod* coriaceous, flattened, ligulate or oblong, 2-valved. Species 8; cosmopolitan in the tropics.

Neptunia oleracea Lour. Fl. Cochinch. 654. An unarmed herb with annual wide-creeping softish swollen stems, rarely emitting sub-erect branches, rooting copiously at the leaf and flower-bearing nodes. *Leaves* 2-pinnate, rachis (including petiole 1·5 in.) 2·5–3 in. long, glabrous; pinnæ 4–6, 2–3 in. long, with stalk ·3 in. long; leaflets 8–15-jugate, narrow-oblong, obtuse, glabrous, ·35–·5 in. long, ·2 in. wide. *Peduncles* ascending 3–12 in. long, glabrous; flowers minute, in dense heads ·5–·75 in. long, ·5 in. across, the lower replaced by numerous ligulate yellow staminodes ·25–·3 in. long, bracts small ovate subobtuse. *Corolla* ·05 in. long. *Pod* oblong, oblique, ·5–1 in. long, ·35 in. wide, beaked, dry, dehiscing early by the upper suture. *Seeds* 6–9, transverse, narrow-oval, somewhat pointed towards hilum, obtuse at opposite end, ·2 in. long, ·12 in. wide, ·1 in. thick, testa brown, polished. Benth. in Hook. Journ. IV, 354; Miq. Flor. Ind. Bat. I, 50; Bak. in. Flor. Brit. Ind.

II, 285. *Mimosa natans* Roxb. Cor. Pl. t. 119; Hort. Beng. 40; Fl. Ind. 553. *Desmanthus natans* Willd. Sp. Pl. IV, 1044; DC. Prodr. II, 444; Wall. Cat. 5295; W. & A. Prodr. 270. *D. lacustris* DC. Prodr. II, 444. *D. stolonifer* DC. Prodr. II, 444.

Penang; Bagian Jumal, *Curtis!* Prov. Wellesley; Butterworth, *King!*

62. Xylia Benth.

Tall unarmed tree. *Leaves* bipinnate. *Flowers* in round heads, mostly perfect. *Calyx* tubular, 5-toothed at the tip. *Petals* 5, valvate, slightly united at the base, little longer than the calyx. *Stamens* 10, free, exserted; anthers gland-crested in an early stage. *Ovary* sessile, many-ovuled; style filiform, stigma minute terminal. *Pod* large, woody, oblong-falcate, finally dehiscing, flat, septate between the oblong compressed seeds.—A single species.

Xylia dolabriformis Benth. in Hook. Journ. Bot. IV, 417. A tree 80–100 feet high, unarmed. *Leaves* 2-pinnate; pinnæ two, terminal on a rachis or petiole 1–2 in. long; leaflets 2–4 pairs, diminishing downward and with below the last pair on the outside a small unopposed leaflet; rachis of pinnæ 3–4 in. long with a gland on the upper side between the bases of each pair of leaflets; terminal leaflets 3–6 in. long, 1·25–2·5 in. wide, lowest pair 1·25–1·5 in. long; all oblong with acute apex and rounded base, subcoriaceous, glabrous on both surfaces; petiolule ·1 in. long. *Inflorescence* of very dense globose heads ·5–·75 in. in diam.; peduncles puberulous 3 in. long, slender, thickening in fruit, crowded on short puberulous branchlets developed with the young leaves. *Calyx* tubular ·2 in. long; teeth 5, valvate. *Corolla* cream-coloured, ·25 in. long, petals slightly cuneate at base, valvate, lanceolate. *Stamens* 10, filaments free, exserted, ·5 in. long, young anthers very minutely gland-crested. *Ovary* sessile, many-ovuled. *Pods* large woody, oblong-falcate, flat, ultimately dehiscent, 4–6 in. long, 1–2·5 in. wide, ·35 in. thick, septate between the seeds. *Seeds* 6–10, broadly ovate, much compressed, ·65 in. long, ·5 in. wide, ·1 in. thick; testa brown, shining, smooth. Bedd. Fl. Sylvat. t. 186; Miq. Flor. Ind. Bat. I, 42; Bak. in Flor. Brit. Ind. II, 286. *Mimosa xylocarpa* Roxb. Cor. Pl. t. 100; Hort. Beng. 40; Fl. Ind. II, 543. *Inga xylocarpa* DC. Prodr. II, 439; Wall. Cat. 5277; W. & A. Prodr. 269. *I. lignosa* Grah. in Wall. Cat. 5278. *I. dolabriformis* Grah. in Wall. Cat. 5279.

Singapore; *Wallich* 5279. Distrib. India, Indo-China, Philippines.

63. Leucæna Benth.

Unarmed erect trees. *Leaves* bipinnate. *Flowers* sessile, in dense globose heads, 5-merous, usually perfect. *Calyx* cylindrical-campanulate

shortly-toothed. *Petals* valvate, free. *Stamens* 10, free, much exserted; anthers not gland-crested. *Ovary* stalked, many-ovuled; style filiform. stigma minute terminal. *Pod* flat, coriaceous, strap-shaped, dehiscent, Species 8, mostly American.

Leucæna glauca Benth. in Hook. Journ. Bot. IV, 416. A low erect tree or large shrub, 6–20 feet high, without spines. *Leaves* 2-pinnate 4–6 in. long, petiole about 2–3 in.; pinnæ 4–8-jugate, 2–3 in. long, stalk ·35 in. long; leaflets 10–15 pairs, linear-oblong, apex acute, base slightly obliquely cuneate, glaucous, membranous, caducous, finely downy, ·4–·5 in. long, ·1–·15 in. wide. *Inflorescence* of very dense globose heads, ·5–·75 in. in diam.; peduncles often geminate 1–1·25 in. long, slender, in fruit often about 2 in. long and slightly thickened. *Flowers* 5-merous, usually all perfect. *Calyx* cylindric-campanulate, teeth short valvate. *Corolla* white, ·15 in. long, petals free, valvate. *Stamens* 10, exserted, ·25 in. long, anthers without glands. *Ovary* stalked, many-ovuled, softly sparsely pubescent; style filiform, stigma small terminal. *Pod* straight, flat, coriaceous, ligulate, dehiscent; 5–6 in. long, ·4–·5 in. wide; stalk ·25–·5 in. long. *Seeds* 15–20, transverse, narrow-ovate, compressed, apex obtuse, base cuneate, ·3 in. long, ·15 in. wide, under ·1 in. thick, testa brown, shining. Miq. Flor. Ind. Bat. I, 41; Bak. in Flor. Brit. Ind. II, 290. *Acacia frondosa* Willd. Sp. Pl. IV, 1076; DC. Prodr. II, 468; W. & A. Prodr. 276. *A. glauca* Willd. Sp. Pl. IV, 1075; DC. Prodr. II, 467. *A. biceps* Willd. Sp. Pl. IV, 1075; DC. Prodr. II, 467. *A. leucocephala* Link. Enum. II, 444; DC. Prodr. II, 467.

Kedah; in open jungle, *Kunstler* 1703! Perak; Lime-stone Hill, Gapis, *Scortechini* 912! Selangor; on hilly ground, *Kunstler* 1130! Pahang; Pulo Tawai, *Ridley* 2642! Penang; Water-fall, etc. *Curtis* 49! Singapore; *Maingay* 583! Distrib. Now cosmopolitan in the tropics but probably originally American.

64. Mimosa Linn.

Shrubs or herbs, with or without prickles. *Leaves* (in the Malayan species) bipinnate; leaflets small, sensitive, ligulate, caducous. *Flowers* minute, in dense globose heads, polygamous, (in the Indian species) mostly tetramerous. *Calyx* campanulate, shortly toothed. *Petals* connate towards the base. *Stamens* as many as, or twice the number of, the petals, much exserted, filaments filiform, free; anthers not gland-crested. *Ovary* stalked, many-ovuled; style filiform, stigma minute terminal. *Pod* flat, membranous, made up of 1-seeded joints that separate, when mature, from the sutures. Species 230, mostly confined to Trop. America.

Stamens 4; rachis of leaf bristly, stem bristly and prickly, leaves digitately divided, sutures of pod prickly ... ... 1. *M. pudica.*

Stamens 8–10; rachis of leaf smooth, stem prickly not bristly, leaves pinnately divided, sutures of pod not prickly ... ... 2. *M. sepiaria.*

1. Mimosa pudica Linn. Sp. Pl. 518. A diffusely spreading undershrub rarely over 2 feet high, with stems and branchlets sparsely prickly and copiously beset with deflexed bristles. *Leaves* very sensitive, with usually 4 digitate pinnæ, sessile at the end of a petiole 2 in. or more long, beset with spreading bristles; stipules lanceolate ·35 in. long, striate, subscarious, with margins beset with spreading bristles; pinnæ 2·5–3·5 in. long, the rachis beset with ascending bristles; leaflets 12–20 pairs, glabrous above, sparsely adpressed-bristly beneath, subcoriaceous, narrow-oblong, obliquely acute at apex of upper angle, obliquely rounded at lower side of sub-5-nerved base, main-nerve branching slightly upwards, ·35 in. long, ·15 in. wide; sessile. *Inflorescence* capitate, the heads usually in pairs from axils all along the branches, ·35 in. in diam.; peduncles very slender ·75–1 in. long, beset with spreading prickles. *Calyx* campanulate, teeth short valvate. *Corolla* pink, ·1 in. long, petals connate below valvate above. *Stamens* 4, much exserted, filaments ·3 in. long, filiform, free, anthers without glands. *Ovary* stalked; style filiform, stigma very small terminal. *Pods* flat, slightly recurved, membranous, ·6–1 in. long, ·2 in. across, made up of 3–5 1-seeded joints that fall away when mature from the persistent armed sutures, which are clothed with weak spreading yellowish-white bristles ·15–·2 in. long. DC. Prodr. ·II, 426; Roxb. Hort. Beng. 41; Wall. Cat. 5292; Roxb. Flor. Ind. II, 564; Miq. Flor. Ind. Bat. I, 43; Bak. in Flor. Brit. Ind. II, 291. The Sensitive Plant.

Andamans; extremely common throughout the settlement. Penang; overspreading the whole coast-line, *Curtis* 1237! Singapore; *T. Anderson* 32! *Maingay* 584! Distrib. Throughout S.-E. Asia, probably originally introduced from America.

This, having been introduced into the settlement at Port Blair in the Andamans, has there spread so much as to have become extremely troublesome; a large labour force has to be constantly told off to try and keep it in check; its complete eradication is apparently hopeless.

2. Mimosa sepiaria Benth. in Hook. Journ. Bot. IV, 395. A woody shrub with puberulous branchlets soon glabrescent, sparingly armed with strong compressed slightly recurved prickles. *Leaves* 2-pinnate, rachis slightly downy 2 in. long (the petiolar part ·75 in long); pinnæ 6–8-jugate, 1·5 in. long, subsessile, upper side pubescent; leaflets 12–20-jugate, rigidly coriaceous, narrow-ligulate, caducous, ·25–·35 in. long, ·1–·15 in. wide, subacute at apex, obliquely truncate at lower side of sub-5-nerved sessile base, main-nerve branching considerably upwards. *Inflorescence* capitate, the heads ·25 in. in diam., arranged in

ample patent terminal panicles with puberulous main-rachis and compound puberulous lower branches; the whole 6–8 in. long, 4–6 in. wide, peduncles of individual heads ·5–·75 in. long. *Calyx* campanulate, teeth short, valvate. *Corolla* ·05 in. long. *Stamens* 8–10, filaments free, ·1 in. long. *Ovary* stalked; style filiform, stigma small terminal. *Pod* with a slender stalk ·2 in. long, flat, almost straight, membranous, 1·5–2 in. long, ·25 in. wide, made up of 6–8 glossy, finely reticulated 1-seeded joints that fall away when mature from the persistent unarmed sutures. Bak. in Flor. Brit. Ind. II, 291. *M. nigrescens* Maingay MSS.

Singapore; *Maingay* 582! *Anderson* 34! *Kurz!* *King!* Distrib. Occurs also in China and in Borneo, but no doubt is an introduction from America; it is only found near clearings.

65. Acacia Willd.

Spinose or prickly shrubs or trees, erect or climbing. *Leaves* bipinnate, with minute leaflets. *Flowers* in globose heads or cylindrical spikes, hermaphrodite or polygamous, usually pentamerous. *Calyx* campanulate or funnel-shaped, shortly toothed. *Petals* exserted, united in the lower half. *Stamens* free, indefinite, much exserted; anthers minute, not gland-crested. *Ovary* stalked or sessile, many-ovuled; style filiform, stigma minute capitate. *Pod* ligulate or oblong, not jointed, usually compressed and dry, dehiscent or indehiscent, rarely turgid or subcylindrical, sutures straight or wavy, not thickened. Species 430; the leafy groups cosmopolitan in the tropics, the great phyllodineous series, which comprises two-thirds of the genus, almost restricted to Australia. None of the species with spicate inflorescence occur within our area.

Erect shrubs or small trees, with stipular spines, bracteate pedicels and cylindric pods	1.	*A. Farnesiana.*
Climbing shrubs, with non-spinescent stipules, and with prickly branches; pedicels naked; pods flat:—		
Flower heads ·4 in. across; leaflets narrow oblong ...	2.	*A. pseudo-Intsia.*
Flower heads ·2 in. across; leaflets linear	3.	*A. pennata.*

1. Acacia Farnesiana Willd. Sp. Pl. IV, 1083. A shrub or low tree with slender zig-zag branches marked with grey dots. *Leaves* 2-pinnate; rachis downy 1–1·5 in. long with a minute petiolar gland; pinnæ 8–16, 1–1·5 in. long; leaflets 10–20 pairs, green, subglabrous, rigidly coriaceous, linear-oblong, ·25 in. long, ·05 in. wide; stipules spinescent seldom over ·25–·35 in. long on the branchlets, persisting and on old branches sometimes over 1 in. long, polished, white, straight. *Flowers* in rounded heads ·35 in. in diam., fragrant, bright yellow; peduncles crowded on axillary nodes, slender, puberulous, ·75–1 in. long, with a ring of small bracts at or near the apex. *Calyx* campanulate, minute.

Corolla ·05 in. long, teeth short obtuse. *Pod* thick cylindric glabrous, 2–3 in. long, ·5 in. thick, dull-brown marked with fine horizontal striæ; mesocarp pulpy enclosing the biseriate seeds. *Seeds* 12–18, ovate, ·3 in. long, ·2 in. wide, ·15 in. thick, smooth, dull-brown with faint lateral areola. DC. Prodr. II, 461; Wall. Cat. 5264 A–F; Bedd. Flor. Sylvat. t. 52; Miq. Flor. Ind. Bat. I, 7; Bak. in Flor. Brit. Ind. II, 292. *Mimosa Farnesiana* Linn. Sp. Pl. 521; Roxb. Hort. Beng. 40; Flor. Ind. II, 557. *Vachellia Farnesiana* W. & A. Prodr. 272; Wight, Ic. t. 300. *Acacia indica* Desv. Journ. Bot. I, 69; DC. Prodr. II, 462. *Farnesia odora* Gaspar. Desc. Nuov. Gen. Legum. (1838) *with plate.*

Planted in some of the provinces:—Andamans; *Kurz!* Penang; *Porter* (Wall. Cat. 5264F)! Pahang; Kutapong, *Ridley* 1246! Distrib. Cosmopolitan (perhaps usually planted) in the tropics.

2. Acacia pseudo-Intsia Miq. Flor. Ind. Bat. I, 12. A large scandent shrub 12–20 feet high, the branches and branchlets armed with many small sharp recurved glossy dark-coloured prickles; young branches blackish, puberulous or glabrescent. *Leaves* 2-pinnate, rachis 8 in. long, puberulous or glabrescent, strongly armed with recurved prickles beneath, petiolar portion 2·5 in. long with a large projecting gland close to base on its upper surface; pinnæ 8–12-pairs, 2·5–3·5 in. long, the upper 2–4 pairs with glands between their bases; leaflets 30–35 pairs, sessile, linear-oblong, obtuse, ·4 in. long, ·15 in. wide, rigidly subcoriaceous, glabrous above, adpressed-puberulous or glabrous beneath. *Flowers* in rounded heads, ·4 in. in diam., yellow, peduncles ·5–·75 in. long, slender, puberulous, naked, in clusters of 2–4, rarely solitary along a panicle extending 10–12 in. beyond the leaves; bracts large, ovate-acute or acuminate, ·2–·25 in. long. *Calyx* puberulous, ·07 in. long. *Corolla* ·1 in. long. *Pod* not seen.

Var. *typica;* bracts puberulous, pedicels ·5 in. long, leaflets adpressed-puberulous beneath.

Singapore; Changhi, *Hullett* 835! *Ridley* 3631! Bukit Timah, *Ridley* 6177! Distrib. Sumatra, Java.

Var. *ambigua* Prain; bracts glabrous, pedicels ·75 in. long, leaflets quite glabrous beneath.

Andamans; very common, *King's Collectors!*

In externals the Singapore plant much resembles *A. caesia* W. & A., the Andamans one at the same time resembling *A. Intsia* Willd. except in having the leaflets crowded. Closer examination shows, however, that the natural alliance of the species is rather with the group of forms aggregated under the name *A. pennata;* the large bracts, in particular, make all further comparison with the group to which *A. Intsia* belongs an impossiblity.

Its nearest ally is a species from Northern Indo-China described by Kurz under the name *A. pruinescens* from which this differs in having broader leaflets, in

having no bloom on the young branches, and particularly in having the large petiolar gland very near the base of the petiole; the corresponding gland in *A. pruinescens* is about an inch above the base. The two species *A. pseudo-Intsia* and *A. pruinescens* taken together form a group that is almost exactly intermediate between the *A. Intsia* and the *A. pennata* groups.

3. Acacia pennata Willd.; Bak. in Flor. Brit. Ind. II, 297. A large scandent bush or strong creeper, sometimes extending for 50–60 feet, branches and branchlets armed with many small sharp slightly recurved glossy brown or blackish prickles, young twigs faintly pubescent or glabrous. *Leaves* 2-pinnate; the rachis 6 in. long, glabrous or puberulous, prickly beneath or unarmed, petiolar portion ·75–1 in. long with a projecting large or small gland ·4–·5 in. above the base; pinnæ 20–40 pairs, 1·25–2 in. long, the upper pairs with glands between their bases; leaflets 35–40 pairs, sessile, linear, ·2–·35 in. long, under ·05 in. wide, firm, glabrous. *Flowers* in rounded heads ·2 in. in diam., white or pale-yellow, peduncles ·5–·7 in. long, slender, puberulous, naked, in clusters of from 4–8 along a panicle extending 12–15 in. beyond the leaves; bracts small linear, ·1 in. long. *Calyx* glabrous, ·05 in. long, campanulate. *Corolla* ·07 in. long. *Pod* linear-oblong, acute or acuminate at both ends, 4–6 in. long, ·75–1 in. wide, flat, very thin, with a stalk under ·2 in. long, the sutures slightly thickened. *Seeds* flat, ovate, ·4 in. long, ·2 in. wide, under ·1 in. thick, faintly areolate, dull-brown, smooth.

Var. *arrophula* Bak. in Flor. Brit. Ind. Ind. II. 298; leaf-rachis almost glabrous, prickly beneath, peduncles 4–6-nate; petiolar gland large, inter-pinnular glands 2–3. *A. arrophula* Don. Prodr. Flor. Nep. 247?

Andamans; very common. Distrib. India, Indo-China.

Var. *pluricapitata* Bak. in Flor. Brit. Ind. II, 298; leaf-rachis puberulous, not prickly, peduncles 6–8-nate; petiolar gland small, inter-pinnular glands 10–12. *A. pluricapitata* Steud. Nomencl. ed. II, I, 7; Benth. Hook. Lond. Journ. I, 516; Pl. Jungh. I, 267. *A. polycephala* Grah. in Wall. Cat. 5255 not of DC.

Penang; *Porter* (Wall. Cat. 5255)! Malacca; *Griffith! Maingay* 585! *Derry* 166! *Holmberg* 838! *Hervey*! Perak; *Scortechini! Kunstler* 482! 3332! 4876! 5504! 10300! Distrib. Malay Archipelago.

Following the *Flora of British India* these two very distinct plants are here treated as varieties of *Acacia pennata*. That *A. pluricapitata* is deserving of specific rank seems almost certain, and it is probably equally certain that the plant here termed var. *arrophula* should also be separated specifically from *A pennata*. The point can only be satisfactorily settled in a monographic revision of the Indian *Acacias*; pending the preparation of such a revision it seems better to deal with the forms as they have been dealt with by Mr. Baker. The true *A. pennata* of Willdenow is unknown from our area.

66. SERIANTHES Benth.

Unarmed trees. *Leaves* 2-pinnate. *Flowers* racemose, very large, 5-merous, mostly hermaphrodite. *Calyx* deeply campanulate, deeply toothed. *Petals* adnate to the base of the staminal column, free above. *Stamens* monadelphous, very numerous; anthers minute. *Ovary* sessile, many-ovuled; style filiform, stigma minute capitate. *Pod* large oblong, almost woody, somewhat turgid, indehiscent, septate between the seeds. Species 2, one in Malaya, one in Polynesia.

SERIANTHES GRANDIFLORA Benth. in Hook. Lond. Journ. Bot. III, 225. A large unarmed tree with rusty-puberulous young branches. *Leaves* evenly 2-pinnate, rachis puberulous 7–9 in. long, with a large sessile gland ·25 in. above base and with small glands between the bases of each pair of pinnæ; pinnæ 3–8-jugate, 3–4 in. long, puberulous; leaflets 6–12 pairs, obliquely oblong, subfalcate, obtuse, base obliquely truncate, ·5–1 in. long, ·3–·6 in. wide, rigidly subcoriaceous, glossy-green above, paler dull reticulate-veined beneath, glabrous on both surfaces. *Flowers* few, in axillary corymbose panicles 4–6 in. long, main-rachis puberulous, peduncular portion 2 in. long, the branches puberulous ·5–·7 in. long, each 2–4-fld; pedicels densely tomentose ·2 in. long; buds oblong or globose, ·35 in. across. *Calyx* wide-campanulate, ·5 in. long, ·35 in. wide with triangular teeth one-third the length of tube, uniformly densely felted externally. *Corolla* yellowish-white, 1·5 in. long, the segments densely woolly externally, glabrous within. *Filaments* over 500, 2·5 in. long. *Pod* turgid, 6 in. long, 2·25 in. wide, ·75 in. thick, epicarp thin brittle, endocarp woody; sutures thin, valves septate and slightly depressed between the seeds. *Seeds* 6–8, narrowly ovate, the long axis across the pod, ·75 in. long, ·3 in. across, ·15 in. thick, testa dark-brown, smooth but hardly shining, seed faintly areolate. Miq. Flor. Ind. Bat. I, 40; Bak. in. Flor. Brit. Ind. II, 301. *Inga Finlaysoniana* Wall. Cat. 5284. *I. grandiflora* Wall. Cat. 5285. *I. ventricosa* Grah. in Wall. Cat. 5266 in part.

SINGAPORE; *Wallich! Finlayson.* MALACCA; *Griffith! Maingay* 580! DISTRIB. Malay Archipelago.

67. ENTEROLOBIUM Mart.

Erect unarmed trees. *Leaves* bipinnate. *Flowers* in globose heads, 5-merous, usually hermaphrodite. *Calyx* campanulate or subcampanulate, shortly toothed. *Corolla* subinfundibuliform, the petals connate to the middle. *Stamens* monadelphous much exserted; anthers small not gland-crested. *Ovary* sessile many-ovuled; style filiform, stigma minute capitate. *Pod* strap-shaped straight or curved, indehiscent, mesocarp spongy at length hardening, or pulpy and soft, endocarp firm

forming continuous septa between the seeds; the sutures thickened. Species 5 or 6, all American; one introduced and now becoming subspontaneous in S.-E. Asia.

Enterolobium Saman Prain. A large spreading tree 40–60 feet high, stem 3 feet or more thick, branches pubescent. *Leaves* evenly 2-pinnate, rachis 4–6 in. long, pubescent, basal gland none but with glands between the bases of each pair of pinnæ, single in the upper, paired in the lower half of the rachis; pinnæ 4–6-jugate, 2–3 in. long, rachises pubescent with glands between each pair of leaflets; leaflets decreasing downwards, 6–8-jugate in the upper, 3–5-jugate in the lower pinnæ, ovate-oblong rigidly coriaceous, glabrous above, densely pubescent beneath, apex obtuse, base obliquely truncate, main-nerve diagonal, terminal 1·5 in. long, ·8 in. wide; stipules small lanceolate, densly pubescent, deciduous. *Flowers* in dense heads 1·25 in. across, on pubescent pedicels 2·5 in. long, solitary or 2–3 together in the axils of the upper leaves, each with a lanceolate pubescent bract ·15 in. long and a slender puberulous pedicel ·05 in. long. *Calyx* infundibuliform, densely pubescent externally, ·15 in. long, teeth wide-triangular, short. *Corolla* pinkish, infundibuliform, ·3 in. long, tube puberulous outside, teeth ovate, externally pubescent, half as long as tube. *Filaments* pink, 1·25 in. long, connate at base in a tube one-third as long as that of corolla. *Pod* straight, 6–7 in. long, ·6 in. wide, ·35 in. thick, valves slightly depressed between the seeds, sutures thickened, epicarp thinly crustaceous, mesocarp pulpy, endocarp firmly crustaceous and forming continous septa between the seeds. *Seeds* 16–20, transversely ovate, ·4 in. long, ·25 in. wide, ·2 in. thick, testa smooth brown shining with distinct duller darker-brown ovate areola, without arillus. *Inga Saman* Willd. Sp. Pl. IV, 1024. *Pithecolobium Saman* Benth. Hook. Lond. Journ. Bot. III, 216. *Calliandra Saman* Griseb. Fl. W. Ind. 225. The Rain Tree.

Planted in many of the provinces and now appearing subspontaneously, at least in the Andamans and Nicobars. A native of Guiana; introduced in the West Indies whence it has been sent to Asia.

This species, though of much more recent introduction than *Pithecolobium dulce*, is also of some economic importance, owing to its rapidity of growth and the readiness with which it thrives, as compared with most native species, when used in the re-afforestation of abandoned clearings. The sweet pulpy pods, of which it produces an abundant crop, are greedily eaten by cattle.

When Mr. Bentham tentatively placed the species in *Pithecolobium* he explained that the tree was unknown to him. Dr. Grisebach, who had the advantage of studying the tree in the living state, at once recognised that it cannot possibly be a *Pithecolobium* and placed it in *Calliandra*, no doubt owing to the sutures of its pods being thickened as in that genus. That the pods are septate and indehiscent militates however against his proposal, for the crucial test of a *Calliandra* is that its pods, which may *not* be septate, shall debisce elastically from apex to base. The *Index*

Kewensis has therefore replaced the 'Rain-Tree' in *Pithecolobium*; this, however, is a step which in turn similarly mars the generic limits of that group since the pods of *Pithecolobium* must *not* be septate. The writer places the species with more confidence in *Enterolobium* owing to its possessing the septate pods characteristic of that genus. The pulpy, in place of spongy at length indurated mesocarp, and the shortly pedicelled in place of sessile florets, cannot, in view of the variability of these characters within adjacent genera, be considered more than comparatively trivial deviations from the hitherto recognised characters of *Enterolobium*. The writer is unable, both on academic and on practical grounds, to agree with the proposal, made by some botanists, to amalgamate *Calliandra*, *Pithecolobium*, *Enterolobium* and *Albizzia*.

68. Calliandra Benth.

Shrubs or trees. *Leaves* bipinnate, with small or large leaflets. *Flowers* in globose heads, polygamous, 5-merous. *Calyx* campanulate, toothed. *Corolla* funnel-shaped, deeply 5-cleft. *Stamens* indefinite, monadelphous at the base, filaments filiform much exserted; anthers minute, not gland-crested. *Ovary* stalked, many-ovuled; style filiform, stigma minute capitate. *Pod* strap-shaped, slightly falcate, flat, rigidly coriaceous, the valves dehiscing with elasticity, bordered by much-thickened sutures, continuous within, narrowed gradually to a short stalk. Species 80, mostly tropical American.

Calliandra umbrosa Benth. in Gen. Pl. I, 597. A tree 20–25 feet high, with slender glabrous branches and sometimes with small suberect stipular spines. *Leaves* 2-pinnate, petiole 1·25 in. long, glabrous; pinnæ 2, terminal, each with rachis 1·25–1·5 in. long, with a pair of large sessile, oblique, oblong, rigidly subcoriaceous end-leaflets, acute at apex, cuneate at base, 6 in. long, 2 in. wide and with an odd similar but much smaller leaflet 1·5–2 in. long, ·5–·75 in. wide, on the outer side below; leaflets all glabrous on both sides, rather distinctly nerved beneath and each with a gland on rachis at base. *Flowers* sessile in small dense globose heads ·4 in. across, with minute bracts, on short ascending slender peduncles ·4–·5 in. long, usually several together from old nodes on the branches; elongating in fruit to 1·5–2 in. *Calyx* campanulate, teeth valvate. *Corolla* ·12 in. long, yellow, inodorous. *Pod* 6–9 in. long, ·75–1 in. wide, smooth, finely veined, the valves with elevated rounded thickened edges. *Seeds* 6–9, ovate, ·5 in. long, ·35 in. wide, long diameter transverse, very much compressed; testa smooth shining thin crustaceous brown. Bak. in Flor. Brit. Ind. II, 302. *Inga umbrosa* Wall. Pl. As. Rar. t. 124; Cat. 5273. *Albizzia umbrosa* Benth. in Hook. Lond. Journ. III, 86.

Penang; *fide* Baker in *Flora of British India*.

There are no Malayan specimens at Calcutta; Mr. Baker, however, alludes to the existence of Penang examples.

69. Albizzia Durazz.

Large trees or, sometimes, (*A. myriophylla*) shrubs usually climbing. *Leaves* bipinnate. *Flowers* (in the Indian species) in globose heads, sessile or pedicellate, usually pentamerous and all hermaphrodite. *Calyx* campanulate or funnel-shaped, distinctly toothed. *Corolla* funnel-shaped, petals firmly united below the middle. *Stamens* indefinite, monadelphous at the base, filaments several times the length of the corolla; anthers minute, not gland-crested. *Ovary* sessile or shortly-stalked; style filiform, stigma capitate minute. *Pod* large, thin, flat, strap-shaped, straight, indehiscent or subindehiscent, continuous within, the sutures not thickened. Distrib. Species 25–30, spread through the Tropics of the Old World.

Shrub, often climbing, the pulvinus below leaf-base enlarging into a firm short recurved hook; the leaflets (numerous) narrowly linear with a median main-nerve ... 1. *A. myriophylla.*

Erect usually large trees, pulvinus not accrescent; the leaflets ovate or oblong, or if linear with the main-nerve nearly marginal:—

Main-nerve close to upper margin; leaflets (numerous) dimidiate-lanceolate; stipules very large; (flowers shortly pedicellate) ... ... 2. *A. stipulata.*

Main-nerve removed one-third to one-half the width of leaflet from upper margin; leaflets ovate or oblong; stipules small:—

Leaflets never more than 2 in. long, rather numerous:—

Glands confined to main-rachis of leaf, leaflets sessile or subsessile:—

Florets pedicellate:—

Pinnæ never more than 4-jugate:—

Umbels small, few-fld., pedicels longer than calyx ... ... 3. *A. littoralis.*

Umbels large, many-fld., pedicels not longer than calyx ... ... 4. *A. Lebbek.*

Pinnæ 6–12-jugate; *indehiscent pod very large and sinuate along the sutures* ... ... 5. *A. pedicellata.*

Florets sessile; *main-nerve nearer upper than lower leaf-margin* ... ... 6. *A. odoratissima.*

Glands on the secondary rachises as well as on the main-rachis, leaflets shortly petiolulate; (florets sessile) ... ... 7. *A. procera.*

Leaflets few, large; the terminal pairs 4 in. long; (main and secondary rachises both gland-bearing, pinnæ normally 1-jugate) ... ... 8. *A. lucida.*

1. Albizzia myriophylla Benth. in Hook. Lond. Journ. Bot. III, 90. An evergreen unarmed shrub or strong climber 15–20 feet long if climbing, 8–12 ft. high if unsupported, the young shoots shortly tawny-

pubescent, bark thinnish, dark-brown, much lenticelled. *Leaves* evenly 2-pinnate; rachis 5–9 in. long, densely tawny-pubescent, with a medium sessile gland very near the base and with 2–4 small glands between the bases of as many pairs of distal pinnæ, stipules subpersistent, subulate, puberulous, ·15 in. long, deciduous; pulvinus hardening into a recurved almost woody hook; pinnæ 12–20-jugate, 1–1·5 in. long, their rachises sparsely pubescent; leaflets 35–50 pairs, crowded, linear, sessile, slightly falcate, apex subacute, base slightly oblique, rigidly chartaceous, ·2–·25 in. long, ·07 in. wide, dark-green and glabrous above, margin ciliolate or glabrous, paler beneath and glabrous or sometimes sparsely ad pressed-pubescent; midrib central. *Flowers* in small 10–20-fld. heads ·5 in. across, pale-yellow with greenish-yellow stamens, or white; peduncles slender puberulous, ·4–·5 in. long, solitary or 2–6 together on nodes in the upper half of pubescent corymbose branchlets 1–1·5 in. long, with pubescent ovate-acute bracts ·2 in. long, usually accompanied by 2 subulate stipules like those of the leaves, the branchlets disposed in terminal leafy panicles 4–8 in. long, 2–4 in. wide; pedicels 0. *Calyx* campanulate, teeth small, ovate-acute, tube externally densely pubescent, ·04 in. long. *Corolla* infundibuliform, yellowish or white, ·15 in. long, teeth ovate-lanceolate one-third the tube and like it uniformly externally softly puberulous. *Filaments* few, 12–20, united below in a white tube half as long as that of corolla, free portion greenish or white, ·4 in. long. *Pod* dehiscent, 4–5 in. long, ·8–1·2 in. wide, thin, flexible, bright-brown, smooth and shining; opposite the seeds darker and distinctly reticulated. *Seeds* 6–8, obovate, apex obtuse, base cuneate, ·25 in. long, ·2 in wide, much compressed, testa dull-brown, smooth, distinctly areolate. Bak. in Flor. Brit. Ind. II, 300. *Acacia myriophylla* Grah. in Wall. Cat. 5242. *A. foliolosa* Grah. in Wall. Cat. 5241. *Mimosa microphylla* Roxb. Fl. Ind. II, 549.

KEDAH; Langkawi, *Curtis* 2135! 2801! PENANG; *Curtis* 718! 1702! *Kunstler* 1444! PERAK; *Scortechini* 28! 128!

This does not become a tree. When a climber it has not the assistance, as in climbing *Acacias*, of prickles; it developes however hard recurved hooks, that help to serve as hold-fasts, from the thickening of the pulvini at the leaf-bases.

2. ALBIZZIA STIPULATA Boiv. Enycl. XIX Siécle II, 33. An unarmed evergreen tree, often 100–120 feet high, young shoots finely grey-downy, bark dark-grey rugose, stem 3–4 feet thick; heart-wood dark-brown. *Leaves* evenly 2-pinnate, rachis 6–18 in. long, pubescent, with a large sessile gland 1 in above the base and with 2–6 small between the bases of as many distal pairs of pinnæ; pinnæ 6–20-jugate, the secondary rachises tawny-pubescent, 2·5–4 in. long; leaflets 20–45-jugate, dimidiately falcate-lanceolate, sessile, apex acute slightly pointed

forward, base obliquely rounded on lower margin, membranous, ·25–·3 in. long, ·1 in. wide, pale-green glabrous above, glaucous finely downy beneath, the midrib very close to the upper margin; stipules very large, usually 1–1·5 in. long, ·4 in wide, obliquely cordate-acuminate, velvety-pubescent beneath, puberulous above. *Flowers* in numerous heads 1·75 in. across, yellowish-white, the stamens often more or less flushed with pink; peduncles pubescent 1·25 in. long, solitary or in fascicles of 2–4 on nodes in the upper half of pubescent racemose branchlets 3–5 in. long, with large pubescent deciduous ovate-acuminate bracts ·5 in. long, the branchlets in panicles 8–12 in. long, 6–8 in. wide, at the ends of leafy branches; pedicels ·05 in. long, pubescent. *Calyx* ·1 in. long, infundibuliform, teeth short acute, densely uniformly pubescent externally. *Corolla* ·2 in. long, teeth lanceolate acute, half as long as tube and like it densely-pubescent outside. *Filaments* connate at the base in a yellowish tube longer than that of corolla, the free portion of filaments yellowish with a pink flush, or white, ·75 in. long. *Pod* indehiscent 5–6 in. long, ·75–1 in. wide, thin, rigid, pale-brown, dull; valves faintly wide-reticulate. *Seeds* 8–10, ovate, ·25 in. long, ·2 in. wide, much compressed, testa dark-brown, smooth, dull, not areolate. Benth. in Hook. Lond. Journ. Bot. III, 92; Bedd. Fl. Sylvat. t. 55; Miq. Flor. Ind. Bat. I, 28; Bak. in Flor. Brit. Ind. II, 300. *Acacia stipulata* DC. Prodr. II, 469; Wall. Cat. 5326; W. & A. Prodr. 274. *A. Smithiana* Wall. Cat. 5237. *A. marginata* Ham. in Wall. Cat. 5243. *Mimosa Smithiana* Roxb. Hort. Beng. 40; Fl. Ind. II, 550. *M. stipulata* Roxb. Hort. Beng. 40. *M. stipulacea* Roxb. Fl. Ind. II, 549. *Arthrosprion stipulatum* Hassk. Retzia I, 212. The White Siris.

Andamans; rare, *E. H. Man!* Nicobars; Kamorta, common, *Kurz!* Distrib. Throughout South-Eastern Asia.

This was once found by Mr. Man in the forests of South Andaman many years ago; none of the numerous collections made in the group during recent years contain any specimens of the species. It becomes quite common again in the Nicobars and in the Malay Archipelago it seems to be as plentiful as it is in India and Indo-China. But from the intervening Malay Peninsula no collector has ever sent a specimen to Calcutta.

Miquel describes three varieties:—

(*α.*) *typica* with greenish stamens.

(*β.*) *vegeta* with pinkish stamens.

(*γ.*) *stipulis persistentibus* with permanent, more pubescent stipules.

But his varieties (*β.*) and (*γ.*) are only forms of one tree and that tree is what constitutes in reality *typical A. stipulata.* What Miquel treats as var. *typica* is Roxburgh's *Mimosa Smithiana,* which has small stipules, and is, if not a distinct species, certainly a very good variety. The Andamans and Nicobars tree is true *A. stipulata;* the other form has not been met with in our area.

3. Albizzia littoralis Teysm. & Binnend., Nat. Tijds. Ned. Ind. XXIX, 259. An unarmed tree 30–40 feet high, young branches glabrous, lenticelled; with ash-grey bark. *Leaves* evenly 2-pinnate; rachis glabrous, 4–8 in. long, with a large sessile gland near base; pinnæ 2–4-jugate, the distal pair 4–5 in. long with leaflets 5–6-jugate, the proximal 3–4 in. long, leaflets 3–4-jugate; leaflets elliptic-oblong or obovate, obtuse or retuse, base obliquely rounded, or rounded on lower cuneate on upper margin, subsessile, submembranous, glabrous pale-green above, faintly puberulous glaucescent beneath, ·75–1·25 in. long, ·4–·75 in. wide. *Flowers* in small few-fld. umbels, under ·5 in. across, white with pink stamens; peduncles slender the longest 1·5 in. long, glabrous or puberulous, corymbosely arranged on leafless branchlets 1–3 in. long, themselves disposed in a terminal corymbose panicle; pedicels ·2–·25 in. long, very slender, glabrous. *Calyx* ·1 in. long, teeth obscure, tube pubescent. *Corolla* ·2 in. long, teeth ovate-lanceolate, externally closely grey-silky as is the tube. *Filaments* connate at base in a uniform white tube shorter than corolla, the free portion of filaments pink. *Pod* 6–7 in. long, 1 in. wide, linear, tapering at both ends, flat, much compressed, glossy pale greenish-brown, uniformly wide-reticulate. *Seeds* 12–16, transversely oval, much compressed, ·4 in. long, ·2 in. wide, ·1 in. thick, testa smooth brown. Kurz, Journ. As. Soc. Beng. XIV, 2, 129.

Nicobars; Nancowry, *Jelinek! King's Collector!* Great Nicobar, *Jelinek.* Penang; Pulo Jungah, *Curtis!* Distrib. Malay Archipelago.

The Nicobarese name is "*Unjiha*;" the name in the Moluccas is "*Kellor-laut.*"

4. Albizzia Lebbek Benth. in Hook. Lond. Journ. Bot. III, 87. An unarmed deciduous tree 40–70 feet high, young shoots puberulous or almost glabrous; with pale bark. *Leaves* evenly 2-pinnate; rachis 3–9 in. long with a large sessile gland near base; pinnæ 2–3- (less often 4-, rarely 1-) jugate, 4 in. long with a gland on the main-rachis above between the bases of the distal, sometimes of the 2 distal pinnæ; leaflets 5–9-jugate, often with glands between their bases, elliptic-oblong or the upper more oblique and obovate-oblong, very obtuse or retuse, base obliquely rounded, or rounded on lower, cuneate on upper margin, subsessile, glabrous above, glabrous or faintly pubescent beneath, reticulate, pale-green, 1–2 in. long, ·5–·75 in. wide. *Flowers* in globular subcapitate umbels 1·25 in. across, white and fragrant; peduncles 2–4 in. long, glabrous or puberulous, solitary or 2–4 together from axils of upper leaves, or corymbose at the ends of short leafless branches; pedicels ·1–·15 in. long, slender, puberulous. *Calyx* ·15–·2 in. long, teeth short deltoid, tube glabrous or puberulous. *Corolla* ·3 in. long, tube glabrous, the teeth ovate-lanceolate, externally pubescent. *Filaments* connate at base in a uniform tube shorter than corolla. *Pod* 4–12 in. long, 1–2 in.

broad; linear-oblong, blunt at both ends, flat, much compressed, with slightly thickened sutures, smooth, glossy, pale straw-coloured except opposite the seeds, there reticulated, pale-brown. *Seeds* 4–12, transversely oval, much compressed, ·6 in. long, ·3 in. wide, ·1 in. thick, testa smooth, pale-brown. Bedd. Fl. Sylvat. t. 53; Bak. in Flor. Brit. Ind. II, 298. *Albizzia latifolia* Boiv. Encyc. II, 33; Miq. Flor. Ind. Bat. I, 22. *Acacia Lebbek* Willd. Sp. Pl. IV, 1066; DC. Prodr. II, 466. *Acacia speciosa* Willd. Sp. Pl. IV, 1066; DC. Prodr. II, 467; W. & A. Prodr. 275. *Acacia Sirissa* Ham. in Wall. Cat. 5265. *Mimosa speciosa* Jacq. Ic. t. 108. *M. Sirissa* Roxb. Hort. Beng. 40; Flor. Ind. II, 544. The Siris.

Planted in some of the provinces:—Andamans; *Kurz!* Penang; *Curtis* 296! Distrib. Planted throughout the tropics; appears to be wild in the drier regions of Asia and Africa.

5. Albizzia pedicellata Bak. ex Benth. in Trans. Linn. Soc. XXX, 563. A tall erect unarmed tree sometimes over 100 feet high, young shoots dark-coloured, faintly rusty-puberulous, bark dark-coloured; stem 3 feet in diam., heart-wood black. *Leaves* evenly 2-pinnate; rachis 5–8 in. long, with a large sessile gland ·5 in. above base, stipules persisting as two firm recurved thickly coriaceous hooklets; pinnæ 6–12-jugate, 4–6 in. long, the main and secondary rachises alike puberulous; leaflets 12–16-jugate, oblong-obtuse, sessile, with slightly obliquely rounded base, rigidly subcoriaceous, ·5–·75 in long, ·3–·4 in. wide, dark-green above, pale but hardly glaucescent beneath, reticulate-veined, quite glabrous on both surfaces. *Flowers* in many-fld. umbels ·75–1 in. across, yellowish-white with green stamens; peduncles slender finely pubescent, 1–1·25 in. long, panicled in fascicles of 2–8 on nodes towards the apices of numerous axillary main-rachises, the nodes sometimes evolved as branchlets 1–2 in. long so as to form compound umbels; main-rachis puberulous, the peduncular portion beneath the flowers 3 in. long towards ends of branches, to 12–15 in. long in the axils lower down; pedicels rusty-pubescent very slender, ·25–·3 in. long. *Calyx* ·15 in. long, teeth short deltoid, densely pubescent externally. *Corolla* ·3 in. long, teeth ovate-acute externally, densely pubescent as is the tube. *Filaments* connate at base in a white tube shorter than corolla, free portions of filaments over 1 in. long, bright-green. *Pod* indehiscent, 12–18 in. long, 2·25–2·5 in. wide, very thin and brittle, pale yellowish-brown, very faintly reticulated opposite the seeds, sinuate-repand along the unthickened sutures. *Seeds* 6–9, transversely ovate, ·25 in. long, ·2 in. wide, much compressed, testa smooth dark-brown. Bak. in Flor. Brit. Ind. II, 299.

Perak; Goping, Ulu Bubong, etc. *Kunstler* 4474! 7988! 10436

PENANG; Waterfall, *Curtis* 1921! MALACCA; *Maingay* 581! 586! *Goodenough*, 1796! SINGAPORE; Kranji Road, *Ridley* 6297!

A very fine species.

6. ALBIZZIA ODORATISSIMA Benth. in Hook. Lond. Journ. Bot. III, 88. A tall erect unarmed tree sometimes 100 feet high, young shoots rather dark-coloured, stem 2–2·5 feet in diam., heart-wood black. *Leaves* evenly 2-pinnate; rachis 6–12 in. long, finely-downy, with a large sessile gland ·5 in. above base and 1–2 small ones between the bases of the distal pairs of pinnæ, stipules small quite deciduous; pinnæ 3–4-(rarely 2-) jugate, usually 5–8 in. long, the secondary rachises glabrous or pubescent; leaflets 8–24-jugate, obliquely oblong, sessile, obtuse, with very obliquely rounded base, rigidly subcoriaceous, ·75–1 in. long, ·3–·5 in. wide, dark-green above, glaucescent beneath, recticulate-veined, the midrib removed by one-third from, and parallel to, the upper edge, glabrous or faintly sparsely adpressed-hairy above, more densely adpressed-hairy beneath. *Flowers* in numerous small 10–12-fld. heads, ·75–1 in. across, yellowish-white with pale-yellow stamens; peduncles slender, puberulous, ·75 in. long, solitary or oftener in fascicles of 3–6 on nodes in the upper third of numerous small corymbose branchlets 2–2·5 in. long, themselves in panicles 8–12 in. long at the ends of leafy branches; pedicels 0. *Calyx* ·05 in. long, teeth obsolete, tube campanulate, externally densely pubescent. *Corolla* ·15 in. long, oblong in bud, teeth ovate-lanceolate, externally densely grey-silky as is the tube. *Filaments* connate at the base in a white tube half as long as that of the corolla, free portion of filaments ·4 in. long, pale-yellow. *Pod* indehiscent, 6–9 in. long, 1·2–1·6 in. wide, thin, flexible, warm-brown, glossy or dull, sutures straight or slightly repand; valves uniformly wide-reticulate. *Seeds* 8–12, broadly ovate, ·3 in. long, ·25 in. wide, much compressed, testa smooth, dull greenish-yellow, faintly areolate. Bedd. Flor. Sylvat. t. 54; Bak. in Flor. Brit. Ind. II, 299. *Albizzia micrantha* Boiv. Encyc. II, 34; Miq. Flor. Ind. Bat. I, 24. *Acacia odoratissima* Willd. Sp. Pl. IV, 1063; DC. Prodr. II, 466; Wall. Cat. 5234; W. & A. Prodr. 275. *Acacia lomatocarpa* DC. Prodr. II, 467. *Mimosa odoratissima* Linn. f. Suppl. 437; Roxb. Cor. Pl. t. 120; Hort. Beng. 40; Fl. Ind. II, 546. *Mimosa marginata* Lamk. Encyc. Meth. I, 12. The BLACK SIRIS.

MALACCA; (*fide* Baker). DISTRIB. India and Indo-China.

Mr. Baker notes the presence of this in Malacca and the species is therefore included here. It is, however, possible that Mr. Baker's specimens are from planted trees, for no botanist has ever communicated Malayan specimens to the Calcutta Herbarium.

7. ALBIZZIA PROCERA Benth. in Hook. Lond. Journ. Bot. III, 89.

An erect unarmed tree 60–80 feet high, young shoots rather pale, much lenticelled, subrugose, glabrous, bark pale-gray outside reddish within, stem 1·5–2 feet in diam.; heart-wood brown. *Leaves* evenly 2-pinnate; rachis 12–18 in. long, glabrous, with a large gland ·25 in. above the base; pinnæ 2–6-jugate, 5–6 in. long, secondary rachises glabrous, with sessile ovate gland below the last pair of leaflets; leaflets 6–12 jugate, obliquely ovate to ovate-oblong with petiolules ·05 in. long, blunt or subacute, the base obliquely cuneate on upper rounded on lower margin; thinly coriaceous, 1–1·5 in. long, (in young trees sometimes 2 in. long) and ·6–·8 in. wide, dark-green glabrous above, paler beneath and when young densely silvery later sparsely adpressed-pubescent. *Flowers* in numerous small 20–25-fld. heads, ·75 in. across, yellowish-white with pale-yellow stamens; peduncles slender puberulous or glabrous, ·5 in. long, in fascicles of 3–5, less often solitary on nodes in the upper half of numerous racemose branchlets 3–5 in. long at the ends of leafy branches; pedicels 0. *Calyx* ·1 in. long, teeth triangular distinct, glabrous externally as is the tube. *Corolla* ·25 in. long, teeth lanceolate half as long as tube, densely uniformly pubescent externally. *Filaments* connate at base in a yellow tube as long as that of corolla, free portion of filaments ·35 in. long, greenish-yellow. *Pod* at length dehiscent, 4–8 in. long, ·7–·9 in. wide, thin, flexible, bright reddish-brown, glossy, sutures straight, slightly thickened; valves not reticulated. *Seeds* 6–12, broadly ovate, ·35 in. long, ·25 in. wide, much compressed, testa smooth pale-brown. Bedd. Flor. Sylvat. 96; Miq. Flor. Ind. Bat. I, 21; Bak. in Flor. Brit. Ind. II, 299. *Acacia procera* Willd. Sp. Pl. IV, 1063; DC. Prodr. II, 466; W. & A. Prodr. 275. *Acacia elata* Grah. in Wall. Cat. 5233; Voigt, Hort. Suburb. Calcutt. 261 (not *Mimosa elata* Roxb.). *Mimosa procera* Roxb. Cor. Pl. t. 121; Hort. Beng. 93; Flor. Ind. II, 548.

Andamans; Coco Group, common, *Prain!* Distrib. Indo-China, China; Malay Archipelago.

It is strange that though this species extends from Nepal to Central China on the north and from Java to the Philippines on the south, it should never have been collected in the Malay Peninsula. More extraordinary still, though quite common at the north end of the Andamans, it seems to be altogether absent from the southern islands of that group and from the Nicobars.

8. Albizzia lucida Benth. in Hook. Lond. Journ. Bot. III, 86. An unarmed deciduous tree 50–60 feet high, all parts glabrous, bark thin, greyish, pustular, stem 1–1·5 feet in diam.; heart-wood pale-brown. *Leaves* evenly 2-pinnate, rachis 1·5–2·5 in. long, quite glabrous, with a sessile cup-shaped gland ·3–·8 in. above the base and with another near the tip; pinnæ usually 1-jugate with secondary rachis 2–3·5 in. long, with a gland on upper side ·25 in. below the distal pair of leaflets and often with a second ·25 in. below the penultimate pair, the leaflets usually 2-,

sometimes 3-, rarely 1-jugate, (when leaflets 3-jugate on the distal pinnæ, leaves occasionally with a second pair of pinnæ with short eglandular rachis under ·5 in. long, bearing 1 pair of small leaflets); leaflets ovate to elliptic-oblong or oblong-lanceolate, apex rather abruptly acuminate, base obliquely cuneate, glossy dark-green above, dull paler beneath, glabrous on both surfaces, thinly chartaceous, decreasing downwards, the distal pairs 4 in. long, 1·5 in wide, the lowest 1·5 in. long, ·7 in. wide. *Flowers* in small heads ·6–·7 in. across, yellowish; peduncles slender, faintly puberulous, ·75–1 in. long, solitary or in fascicles of 2–3 in corymbs on nodes in the upper fourth, or subumbellate at the tips, of numerous branchlets 1·5–6 in. long, themselves in corymbose panicles 8–10 in. long and nearly as wide, at the ends of leafy branches; pedicels ·05–·1 in. long. *Calyx* ·07 in. long, campanulate, faintly toothed, externally puberulous. *Corolla* ·2 in. long, teeth lanceolate, uniformly sparsely silky externally. *Filaments* connate at base in a white tube slightly shorter than that of corolla, free portion of filaments ·35 in. long, pale-yellow. *Pod* at length dehiscent, 6–10 in. long, 1–1·25 in. wide, thin, flexible, pale-brown, dull, reticulated opposite the seeds, smooth glossy elsewhere. *Seeds* 6–8, orbicular, ·3 in. in diam., much compressed, testa smooth, pale-brown. Benth. Pl. Jungh. 268; Miq. Flor. Ind. Bat. I, 18; Bak. in Flor. Brit. Ind. II, 299. *Mimosa lucida* Roxb. Hort. Beng. 40; Flor. Ind. II, 544. *Inga lucida* Wall. Cat. 5267 mostly.

Singapore: *fide* Baker. Distrib. Eastern Himalaya and Indo-China; also Java (*fide* Miquel).

Like *A. odoratissima* this species is included on the authority of Mr. Baker, who records it from the Malayan Peninsula. Dr. Miquel reports it also from Java, but no British or Dutch botanist has ever sent a Malayan specimen to Calcutta.

70. Pithecolobium Mart.

Erect trees. *Leaves* abruptly 2-pinnate. *Flowers* in globose heads, rarely in small loose spikes or subumbellate corymbs, usually hermaphrodite and pentamerous. *Calyx* campanulate or funnel-shaped, shortly toothed. *Corolla* funnel-shaped, the petals united below from one-half to two-thirds their length. *Stamens* monadelphous, much exserted; anthers without glands. *Ovary* sessile or stipitate, many-ovuled; style filiform, stigma minute capitate. *Pod* strap-shaped, circinate or rarely falcate or nearly straight, usually dehiscent throughout the lower suture and much twisted in a late stage, sutures not or slightly thickened.

Species about 100; cosmopolitan in the Tropics, about 80% American, only 1–2 African.

Armed with spinescent stipules; seeds arillate; (pinnæ of leaves 1-jugate, their rachises gland-bearing; leaflets 1-jugate; pods close-spiral, dehiscent along lower suture, testa of distant seeds thin) ... ... 1. *P. dulce.*

Unarmed; seeds without arillus :—

Pod indehiscent, (horse-shoe shaped), seeds (distant) with a thick leathery testa; (pinnæ 1-jugate, their rachises gland-bearing, leaflets glabrous 2-jugate) ... ... 2. *P. confertum.*

Pods dehiscent, seeds with a thin crustaceous testa :—

Pods straight or slightly falcate, opening along both sutures, valves thick, fleshy, seeds close-set, mutually compressed; (pinnæ 1-jugate, their rachises gland-bearing, leaflets glabrous 1–2-jugate) ... 3. *P. bubalinum.*

Pods spirally twisted, opening only along the lower suture, valves coriaceous, seeds distant :—

Pods deeply lobed between the seeds half-way down to upper suture or further, dehiscing only opposite the seeds; (pinnæ 1-jugate, their rachises gland-bearing, leaflets glabrous 2-3-jugate) ... ... 4. *P. lobatum.*

Pods only faintly sinuate on lower suture between the seeds, dehiscence along lower suture continuous :—

Pinnæ 1-jugate without glands on their rachises; (leaflets glabrous) :—

Pods large, ·75 in. broad; seeds somewhat compressed, ·6 in long; leaflets 2-jugate apex acute 5. *P. nicobaricum.*

Pods small, ·4 in. broad; seeds pisiform, ·2 in. across; leaflets 3–4-jugate, apex caudate-acuminate ... ... 6. *P. microcarpum.*

Pinnæ more than 1-jugate or, if casually 1-jugate then with glands on their rachises; (pods large) :—

Pods broad, 1·25 in. wide or more; leaflets very large, glabrous; (pinnæ 2-jugate, distal much exceeding the proximal casually absent pair) :—

Rachises of pinnæ with glands between each pair of leaflets; flowers in dense many-fld. heads ·75 in. across; leaflets shining on both surfaces; branches of panicle terete ... 7. *P. affine.*

Rachises of pinnæ with glands between bases of terminal leaflets only; flowers in few-fld. heads ·2 in. across; leaflets dull beneath, branches of panicle subcompressed ... ... 8. *P. ellipticum.*

Pods narrow, ·75 in. wide or less; leaflets medium or small, puberulous or pubescent beneath :—

Flowers large (·5 in. long); pod long-stipitate, seeds with long axis parallel to sutures; (pinnæ 2-jugate or casually 1-jugate, leaflets medium; branches terete) ... ... 9. *P. Kunstleri.*

Flowers small (under ·25 in. long); pod short-stipitate, seeds with long axis transverse :—

Florets sessile, branches terete; leaflets of distal pinnæ 15–20-jugate; (pinnæ 5–8-jugate, leaflets small, all rhomboid, the distal pairs not much exceeding the others) ...	10.	*P. contortum.*
Florets pedicellate, branches angled; leaflets of distal pinnæ 5–8-jugate: —		
Pinnæ 3-6- (rarely 8–10-) jugate; leaflets small, all trapezoid, the distal pairs not much exceeding the others; glands stipitate	11.	*P. Clypearia.*
Pinnæ 2–4-jugate; leaflets medium, terminal cuneate at base, considerably exceeding the subtrapezoid others; glands sessile ...	12.	*P. angulatum.*

1. Pithecolobium dulce Benth. in Hook. Lond. Journ. Bot. III, 199. A tree 25–40 feet high with glabrous branches; stem 2 feet in diam., the ultimate branchlets pendent, armed with stipular thorns. *Leaves* evenly 2-pinnate, rachis 1 in. long glabrous, basal gland 0, with a sessile small cupped-gland at its apex between the bases of the 1-jugate pinnæ, with secondary rachises ·25 in. long also gland-bearing at apices between the bases of the 1-jugate leaflets glabrous on both surfaces, pale-green, approximated, oblique obovate-oblong, rigidly subcoriaceous, obtuse or occasionally subacute, 1–2 in. long, ·3–·7 in. wide; stipules ascending, ·2–·3 in. long, converted into conical smooth thorns, the main and secondary rachises both shortly produced in acute points. *Flowers* in dense heads ·4–·5 in. in diam., on puberulous pedicels ·25 in. long, solitary or 2–3 together in the axils of small lanceolate bracts ·1 in. long, along slender nodiform branchlets slightly zig-zag towards their tips, glabrous or puberulous, striate, from 3–5 in. long, the bracts of the lower two-thirds accompanied by minute stipular spines, those of the lowest fourth often replaced by reduced foliage leaves; the branches arranged in terminal panicles 7–12 in. long, 5–8 in. wide, extending into the upper axils. *Calyx* ·05 in. long, grey-downy, subcampanulate, shortly toothed. *Corolla* white, ·1 in. long, puberulous tube wide-infundibuliform, rather longer than the ovate-acute teeth. *Filaments* united at base in a tube as long as that of the corolla, shortly exserted. *Ovary* puberulous, shortly stipitate. *Pod* turgid, twisted, dehiscent along the lower suture, both sutures slightly indented between the seeds, 4–5 in. long, ·5 in. wide; glabrous, wide-reticulated, the valves coriaceous, claret-red when ripe. *Seeds* 6–8, obovate-oblong, ·5 in. long, ·3 in. wide, ·2 in. thick, testa smooth shining purplish, enveloped in a firm edible pulpy pale arillus. Miq. Flor. Ind. Bat. I, 40; Bedd. Flor. Sylvat. t. 188; Bak. in Flor. Brit. Ind. II, 302. *Mimosa dulcis* Roxb.

Cor. Pl. I. t. 99; Hort. Beng. 40; Flor. Ind. II, 556. *Inga dulcis* Willd. Sp. Pl. IV, 1005; DC. Prodr. II, 436; Wall. Cat. 5282; W. & A Prodr. 268; Wight, Ic. t. 198.

Cultivated in most of the Provinces; PENANG; *Curtis* 59! SINGAPORE; *Maingay* 579! ANDAMANS: common. NICOBARS; Car Nicobar, *King's Collector!*

A native of America whence it has been introduced, by way of the Philippines, to Malaya generally, and to India.

2. PITHECOLOBIUM CONFERTUM Benth. Trans. Linn. Soc. XXX, 304. An unarmed small tree with glabrous lenticelled branchlets with dark-brown bark. *Leaves* evenly 2-pinnate, rachis glabrous ·75 in. long, with no basal gland but with a long elliptic gland just below the bases of the 1-jugate pinnæ; rachises of pinnæ glabrous, 2 in. long, with glands between the bases of each of the 2 pairs of leaflets glabrous on both surfaces, bright-green shining above, paler dull beneath, rigidly papery, oblong, shortly obtusely pointed, cuneate at base, distal 3·25–3·75 in. long, 1·75–2 in. wide, proximal 2·5 in. long, 1·25 in. wide, lateral nerves 3–4 pairs ascending; petiolules distinct, glabrous, ·2 in. long. *Flowers* in small 5–10-fld. heads ·75 in. across, on pubescent pedicels ·75 in. long, arranged in small axillary and terminal corymbs 2 in. long and broad with pubescent main-rachises, 1 in. long or less. *Calyx* sessile ·05 in. long, puberulous, campanulate, teeth obsolete; bracteoles minute. *Corolla* white, ·25 in. long, tube glabrescent externally, twice as long as the lanceolate teeth, puberulous on the outside. *Filaments* united at base in a tube slightly longer than that of corolla, free portion white, exserted ·35 in. *Ovary* glabrous, subsessile. *Pod* indehiscent, slightly turgid, horse-shoe shaped or loosely spirally twisted, 10–12 in. long, 1·5 in. wide, sutures firm not at all indented between the seeds, valves thinly coriaceous, glabrous, shining, faintly wide-reticulate. *Seeds* 11–13, compressed ovate, ·75 in. long, ·5 in. wide, ·25 in. thick; testa brown, dull, areolate on the outside, thick, tough and leathery. Bak. in Flor. Brit. Ind. II, 304. *Albizzia splendens* Miq. Flor. Ind. Bat. Suppl. 280.

MALACCA; *Griffith* 1951! *Goodenough* 1766! *Hervey!* DISTRIB. Sumatra (*Teysmann* 4228)!

This species is remarkable in having pods that do not twist spirally and that are apparently quite indehiscent. The seeds have no true arillus but have a thick softly coriaceous tough coat which apparently takes the place of an arillate structure.

3. PITHECOLOBIUM BUBALINUM Benth. Trans. Linn. Soc. XXX, 576. An unarmed tree 30 feet high with pale-brown pubescent branchlets and grey bark. *Leaves* evenly 2-pinnate, rachis puberulous ·5 in. long, with no basal gland but with a round gland just below the bases of the

1-jugate pinnæ; rachises of pinnæ ·75–1·75 in. long with glands between the 1–2 pairs of leaflets, the leaflets oftener 1- than 2-jugate, sometimes 1-jugate on one and 2-jugate on the other pinna of the same leaf; leaflets glabrous on both surfaces, bright-green shining beneath as well as above, rigidly papery, oblong-lanceolate, shortly subacutely pointed, cuneate at base, distal 4–5 in. long, 1·75–2·25 in. wide, proximal 2·5 in. long, 1·25 in. wide, lateral nerves 4–5 pairs ascending, petiolules distinct, glabrous, ·2 in. long. *Flowers* in small 5–8-fld. heads ·3 in. across, on puberulous very slender pedicels ·4–·6 in. long, fascicled in the axils of small bracts and subumbellate at the tips of puberulous peduncles ·75 in. long, subcorymbosely set on branchlets 2·5 in. long, themselves disposed in terminal and axillary panicles 6–8 in. long, 4–6 in. wide. *Calyx* sessile ·05 in. long, pubescent, campanulate, teeth short, deltoid, bracteoles minute. *Corolla* white, ·12 in. long, teeth lanceolate nearly as long as tube, uniformly puberulous externally. *Filaments* united in a tube longer than that of corolla, free portion white, exserted, ·35 in. long. *Ovary* pubescent, distinctly stipitate. *Pod* dark-green inside, reddish outside, dehiscent along both sutures, oblong, straight or falcate, apex obtuse, base obliquely rounded, 3–4 in. long, 1 in. wide, ·75 in. thick, sutures thin not at all indented, valves thick, fleshy, fœtid, densely shortly velvety externally. *Seeds* 8–10, crowded, ovoid, with sides flattened from mutual compression, ·75 in. long, ·4 in. wide and as thick, testa thin crustaceous smooth shining dark-purple; arillus absent. Bak. in Flor. Brit. Ind. II, 304. *Inga bubalina* Jack, Mal. Miscel. II, 7. 77; Hook. Comp. Bot. Mag. I, 224.

Penang; *fide* Baker. Malacca; *Griffith! Maingay* 576! *Goodenough* 1552! Distrib. Sumatra (*Jack; Forbes* 1801!)

Jack gives the Malay name of this as "*Bua Karbau*" in Sumatra; Forbes does not give any native name. In Malacca the name given by Griffith is "*Ingria*," that noted by Goodenough is "*Gerdas Padi*." The fleshy pod is eaten, in spite of its offensive odour.

4. Pithecolobium lobatum Benth. in Hook. Lond. Journ. Bot. III, 208. A tree 60–80 feet high with spreading crown, stem 15–20 in. thick; branchlets glabrous; bark grey. *Leaves* evenly 2-pinnate; rachis glabrous ·6–1 in. long, with a gland near the middle but none at base or between the bases of the 1-jugate pinnæ; rachises of pinnæ glabrous 4–6 in. long, with gland between the bases of the 2–3-jugate leaflets; leaflets oblong to oblong-lanceolate, acute, base cuneate, firmly papery, flexible, glabrous and shining on both sides, medium-green, distal pair 5–8 in. long, 2–3 in. wide, proximal 3 in. long, 1·5 in. wide; petiolules glabrous, ·25 in. long. *Flowers* in small 3–5-fld. heads ·25 in. across, on glabrous slender pedicels ·2–·3 in. long, solitary or 2–3 together on nodes with small glabrous bracts along glabrous branchlets 1–4 in. long,

the larger paniculately branched; fascicled in leaf-axils and on nodes below the leaves near and at the ends of branches. *Calyx* sessile, glabrous or sparsely puberulous, ·05 in. long, tube campanulate, teeth short deltoid ciliate, bracteoles minute glabrous. *Corolla* white, glabrous, ·15 in. long, tube infundibuliform one and a half times the length of the lanceolate teeth. *Filaments* united at base in a tube rather shorter than that of corolla, free portion white, exserted, ·25 in. long. *Ovary* glabrous, stipitate. *Pod* 9–10 in. long, horse-shoe shaped or loosely spirally twisted, valves firmly coriaceous, glabrous, deeply lobed along the lower suture half-way or more towards the entire upper, indehiscent in the sinuses, but dehiscing along the convexities of the one-seeded suborbicular rudely umbonate lobes 2 in. in diam., 1 in. thick. *Seeds* 3–6, (usually some of the lobes are abortive, occasionally two may be confluent), orbicular, ·75 in. in diam., ·35 in. thick, testa dark-brown, thin, rather dull, crustaceous; arillus absent. Hassk. Retzia I. 222; Miq. Flor. Ind. Bat. I, 33; Bak. in Flor. Brit. Ind. II, 305. *Mimosa Koeringa* Roxb. Hort. Beng. 40. *M. Djiringa* Roxb. Hort. Beng. 93. *M. Kaeringa* Roxb. Flor. Ind. II, 543. *M. Jiringa* Jack, Mal. Miscell. I, 1. 14; Hook. Bot. Misc. I, 282. *Inga Jiringa* Jack, Mal. Miscell. II, 7. 78. *Inga attenuata* Grah. in Wall. Cat. 5276. *Inga lobata* Grah. in Wall. Cat. 5280A. *Inga bigemina* Bl. Cat. Buitenz. 88; Hassk. Cat. Bog. 291, not of Willd. *Acacia Koeringa* Royle, Ill. Him. Pl. 183. *Pithecolobium Koeringa* Kuntze MSS. in Herb. Kew.

Penang; *Curtis* 105! 711! 720! 2916! Perak; *Wray* 499! *Kunstler* 5665! 7116! 8651! 10841! Malacca; *Griffith* 1954! *Maingay* 572/2! Singapore; *Kunstler* 1163! *Hullett* 47! Distrib. Tenasserim; Sumatra, ("wild," *Forbes* 1519! 3051!); Java, cultivated (*Kurz* 2110! *Koorders* 4199! 11514!); Philippines, (*fide* Baker).

Curtis gives the Malay name in Penang as "*Jereng;*" Jack gives "*Bua Jiring*" as the name in Sumatra; Roxburgh uses this name and, perhaps, also the name "*Koeringa.*"

Specimens issued by Javanese botanists as *P. bigeminum* always belong to this species; *P. bigeminum* does not occur anywhere in the Malayan countries. Hasskarl states that the name "*Tjering*" is, in Java, limited to the eastern parts of the island where alone the tree occurs uncultivated. The cultivated tree in West Java is termed "*Djenkol.*" This last is the only name cited by Koorders and Valeton (*Bijdr.* I, 268) who say that, though occurring as an escape, the tree is nowhere wild in Java.

Roxburgh, it is to be noted, published two names:—*Mimosa Koeringa* (Hort. Beng. 40)—this he afterwards described as having seeds covered with edible fleshy pulp; and *M. Djiringa* (Hort. Beng. 93)—this he never did describe. It is to the former alone that Royle adverts under the name *Acacia Koeringa*, and it is the latter alone that Jack is careful to cite as synonymous with his *Inga Jiringa.* Of *Inga Jiringa* Jack does *not* say that the seeds are enveloped in pulp; he is careful, however, to imply that, like *I. bubalina*, its seeds *have no arillus*, but that the legume

is fleshy and esculent. When therefore Bentham and, following him, Miquel describe the seeds of their *Pithecolobium lobatum*, for which they cite both of Roxburgh's names, as enveloped in edible pulp, they give a character derived from Roxburgh's description of *M. Koeringa* only.

On Burmese specimens Sir D. Brandis has noted "fruit sold;" Gallatly says "edible.....common in the bazars;" Kurz has said nothing about the fruits or seeds and has not described the latter; Baker too has refrained from describing them. Hasskarl in describing the use of the fruits does not say whether it is the pod or the seed that is employed; he *does* say that the pulp of the seed disappears when the fruit is ripe!* Koorders and Valeton say that the fœtid seeds are eaten *cooked*. Watt in the *Dictionary of the Economic Products of India* only quotes Roxburgh. What the actual facts may be it is for Malayan botanists to declare. Is it the succulent pod, a fleshy pulp, or the seed itself of *Jiring* that is eaten? And has *Jiring* any pulp at all? If so, is this pulp an arillus?

Roxburgh, though he laboured under the double disadvantage of working in the East, and of dealing largely with living plants, was nevertheless remarkably given to being accurate; in spite of the fact that systematists in Europe, whose labours have been simplified by being confined to dried specimens, propose to unite the two, the writer thinks it should be left an open question whether there may not be a *Pithecolobium Koeringa* whose seeds have an edible pulp, and a *Pithecolobium Jiringa* without a pulp enveloping the seeds. If this be so, these are the names that should be used to designate the two trees, since the name *P. lobatum*, though the best to employ so long as the point is in dubiety, must obviously be discarded should it be found that Roxburgh was right.

5. Pithecolobium nicobaricum Prain. A small tree with slender glabrous zig-zag branchlets with dark greenish-brown bark. *Leaves* evenly 2-pinnate; rachis ·75 in. long, glabrous, with a gland just above the middle but none at base or between the 1-jugate pinnæ; rachises of pinnæ 1·5–2 in. long, glabrous, glandless; leaflets 2- (very rarely 3-) jugate, ovate-lanceolate, gradually tapering to the acute apex and cuneate base, bright-green, glabrous on both surfaces, shining above, duller beneath, distal pair 3–4 in. long, 1·4–1·8 in. wide, others 1–2·5 in. long, ·5–1·25 in. wide; petiolules distinct, glabrous, ·1 in. long. *Flowers* in small few-fld. heads on puberulous pedicels ·25 in. long, in terminal and axillary racemes ·75–2 in. long. *Calyx* pubescent, campanulate, ·05 in. long, teeth deltoid, small. *Corolla* and *stamens* not seen. *Pod* dehiscent along lower suture, 5–6 in. long, ·75 in. wide, spirally twisted, valves thickly coriaceous, glabrous, dull, purplish-red, sinuate between the seeds along the upper margin. *Seeds* 8–10, orbicular-ovate, somewhat compressed, ·6 in. long, ·5 in. wide, ·25 in. thick, testa thin, crustaceous, dark-purple smooth shining; arillus absent. *Albizzia bubalina* (*Pithecolobium bubalinum*) Kurz, Journ. As. Soc. Beng. XLV, 2. 129 not of Benth. *Pithecolobium oppositum* Kurz, *loc. cit.*, not of Miq.

* There is no pulp visible in any of our specimens at Calcutta *in any stage of the pod*, whether the specimens come from Burma, the Malay Peninsula, or the Archipelago.

Nicobars; Nancowry, *Jelinek!* Kamorta, *Kurz!*

The Nicobarese name for this tree is "*Kawas.*" Kurz has erred in identifying it with *P. bubalinum* Bth., which it does not much resemble as regards leaves and which it is totally unlike as regards fruits. He has erred still further in identifying it with *P. oppositum* Miq. which he supposed to be identical with *P. bubalinum*. In reality *P. oppositum* has 2-jugate leaves, with leaflets more like those of *P. microcarpum* than like those of either *P. bubalinum* or *P. nicobaricum*, and with the gland on the main-rachis similarly situated. In spite of the fact that Miquel's specimens have neither flowers nor fruits, the writer thinks they belong to a tree that, though a member of the same group as, is probably quite distinct from, all three species mentioned.

6. Pithecolobium microcarpum Benth. in Trans. Linn. Soc. XXX, 576. An unarmed tree 30–70 feet high, with slender pubescent branches with red anastomosing wrinkles, stem 10–15 in. thick, bark greyish-brown. *Leaves* evenly 2-pinnate, rachis puberulous ·5–·75 (rarely 1·25–1·5) in. long, with a gland just below the middle but none at base or between the 1-jugate pinnæ; rachises of pinnæ 2–4 in. long, puberulous, glandless; leaflets 3–4- (rarely only 2-) jugate, firmly chartaceous, ovate, apex rather long obtusely caudate-acuminate, base of distal leaflets cuneate of the others rounded, dark-green shining above, glaucescent beneath, glabrous on both surfaces, distal pair 4–6 in. long, 2–3 in. wide, proximal 3 in. long, 1·5 in. wide; petiolules distinct, glabrous, ·15 in. long. *Flowers* in small 5–8-fld. heads ·4 in. across, on puberulous slender pedicels ·4–·6 in. long, fascicled in the axils of small bracts and subumbellate at the tips of puberulous peduncles 1 in. long, subcorymbosely set on branchlets 2–3 in. long, themselves disposed in terminal and axillary panicles 6–8 in. long, 4–6 in. wide. *Calyx* sessile glabrescent, ·05 in. long, tube campanulate, teeth short deltoid, bracteoles short lanceolate. *Corolla* white, ·15 in. long, teeth ovate-lanceolate equalling the tube, uniformly glabrous externally. *Filaments* united in a tube shorter than that of corolla, free portion white, exserted, ·35 in. long. *Ovary* glabrous subsessile. *Pod* dehiscent along lower suture, spirally twisted, 1·75–2 in. long, ·3–·4 in. wide, sutures thin, the upper very faintly sinuate between the seeds, the valves thinly coriaceous, waxy bright-red. *Seeds* 8–10, pisiform, ·2 in. in diam., testa thin, crustaceous, smooth, shining, dark-purple; arillus absent. Bak. in Flor. Brit. Ind. II, 304. *Inga bubalina* Wall. Cat. 5272 not of Jack. *Pithecolobium bigeminum* var. *bubalina* Benth. in Hook. Lond. Journ. Bot. III, 207; Miq. Flor. Ind. Bat. I, 33 *and* Suppl. 281, *as to the Wallichian synonym only.*

Perak; *Scortechini* 64! 1978! *Kunstler* 1297! 5492! 5842! 10354! 10729! 10802! Penang; *Porter* (Wall. Cat. 5272)! *Curtis* 1093! Malacca; *Griffith* 1947! *Maingay* 567! 574! *Goodenough* 1413! *Derry* 1161! *Hervey!* Singapore; *Ridley* 1634! 6666! *T. Anderson* 40! *Kurz!* Distrib. Sumatra (*fide* Miquel); Borneo.

This very common species has been compared with *P. bubalinum*; in reality the resemblance is very superficial; the leaves differ in having glandless secondary rachises, the leaflets are quite different in shape and the flowers are also very different; in inflorescence the two species are, however, remarkably similar. The nearest ally is undoubtedly *P. oppositum* Miq., of which neither flowers nor fruits are yet known. The leaflets of the two species are of the same shape and have the same caudate tips but those of *P. oppositum* are rather thinner in texture and have puberulous instead of glabrous petiolules besides being arranged on 2 pairs of pinnæ whereas none of our numerous examples of *P. microcarpum* have more than 1 pair of pinnæ.

Goodenough gives "*Kradus*" as the Malay name in Malacca.

7. PITHECOLOBIUM AFFINE Bak. ex Benth. in Trans. Linn. Soc. XXX, 577. A small unarmed tree 15–25 feet high, stem 6–8 in. in diam., young branches rusty-puberulous to pubescent. *Leaves* evenly 2-pinnate, rachis glabrous or puberulous 4–6 in. long, with a large sessile gland ·35 in. above the base, and with similar glands between the bases of the 1–2-jugate pinnæ; secondary rachises of distal pinnæ 6 in. long, with leaflets 4-, (less often 3-) jugate, of proximal pinnæ when present 1·5–2·25 in. long with leaflets 2- (sometimes only 1-) jugate, both with glands between the bases of each pair of leaflets; leaflets papery, glabrous on both surfaces, bright-green, glossy, obovate-acute with subequal cuneate bases, diminishing downwards, distal pair 6–7 in. long, 3–3·25 in. wide, proximal 3 in. long, 1·5–1·75 in. wide; lateral nerves 4–6 pairs ascending; petiolules distinct, glabrous, ·15 in. long. *Flowers* in dense heads ·75 in. across, on slender peduncles ·6 in. long, arranged singly or in fascicles of 2–3 together along branchlets 3–8 in. long, themselves forming an ample terminal panicle 10–15 in. long and broad. *Calyx* subsessile, minutely bracteolate at the base, ·15 in. long, tube funnel-shaped, teeth very short, uniformly brown-silky externally. *Corolla* white, ·25 in. long, uniformly grey-silky externally, teeth ovate-lanceolate, half as long as tube. *Filaments* united in a tube as long as that of corolla, exserted ·35 in., pure white. *Ovary* puberulous, shortly stipitate. *Pod* dehiscent along lower suture, spiral, 8 in. long, 1·25 in. wide, hardly sinuate along upper suture, valves thinly coriaceous, glabrous, shining, faintly wide-reticulate, dark-green externally, bright orange-red within. *Seeds* 6–8, transverse, ovate-oblong, 1 in. long, ·5 in. wide, ·4 in. thick, testa thin crustaceous dark-purple smooth shining; without arillus. Bak. in Flor. Brit. Ind. II, 304.

MALACCA; *Maingay* 577! *Hervey!* PERAK; *Kunstler* 3406! 3957! 5560! SINGAPORE; Tanjong Bunga, *Ridley* 6408! DISTRIB. Burma (*Brandis!*); Borneo.

The pod is given in the *Flora of British India* as ·25 in. wide; this may be a misprint for 1·25 in. At all events the fruit of the species of which Maingay n. 577 forms the basis is as now described. The Borneo locality is given doubtfully

by Mr. Bentham; the pod which he describes, and which belonged to his Borneo specimens, evidently agrees very closely with that of the Peninsular plant.

8. Pithecolobium ellipticum Hassk., Retzia I, 225. A tree 15–30 feet high (occasionally higher) branchlets tawny-puberulous soon glabrescent, bark grey. *Leaves* evenly 2-pinnate, rachis glabrous 3–4 in. long, with a large gland above base and another between the bases of the distal pinnæ; pinnæ 2-jugate, rachises of distal pair 4–7 in. long, with small glands between each pair of leaflets except the lowest, of proximal pair often only subopposite always within an inch of base of main-rachis ·75–1 in., with gland between the end pair of leaflets; leaflets very large, of upper pinnæ 3–4-jugate, distal 6–8 in. long, 2·5–3 in. wide, of proximal 3 in. long, 2 in. wide; leaflets of lower pinnæ usually 2-jugate, distal 4 in. long, 1·5 in. wide, lowest 2 in. long, 1 in. wide, the leaflets often unequally-jugate on the corresponding pinnæ of the same leaf, elliptic-oblong, apex rather abruptly pointed, base rounded, glabrous on both surfaces, bright green shining above, paler dull beneath; petiolules glabrous, ·25 in. long, lateral nerves 5–8 pairs, ascending. *Flowers* in very small 2–5-fld. heads ·2 in. or less across, on short tawny-puberulous peduncles ·25–·35 in. long, solitary or 2–3 vertically superposed above the axils of bracts with a large gland, on subcompressed branchlets 1·5–6 in. long, also 2–3 vertically superposed above the axils of larger bracts ·25–·6 in. long with a large sessile gland and small rudimentary leaflets; the branches of each axil diminishing downwards; branches themselves similarly disposed on a subcompressed tawny-pubescent main-rachis as a terminal panicle 16–20 in. long, 6–12 in. wide. *Calyx* campanulate, tawny-pubescent, ·05 in. long, teeth short obtuse. *Corolla* yellow, silky, ·15 in. long, teeth ovate-lanceolate nearly as long as tube. *Filaments* united at base in a thick short ring, yellowish, ·2 in. long, shortly exserted. *Ovary* with a short stipe as long as staminal tube. *Pod* spirally twisted, 3–7 in. long, dehiscent along the lower suture, 1·25 in. wide, valves firmly coriaceous, glabrous, dull, dark-green, at length becoming yellow externally, orange within. *Seeds* 3–7, oblong, ·8 in. long, ·6 in. wide, ·4 in. thick, testa thin, crustaceous, dark-purple, smooth, shining; without arillus. *Inga elliptica* Bl. Cat. Gew. Buitenz. 88; Ind. Kew. I, 1216. *Inga Jiringa* Wall. Cat. 5268 not of Jack. *Inga Clypearia* Wall. Cat. 5270 B. not of Jack. *Pithecolobium fasciculatum* Benth. Hook. Lond. Journ. Bot. III, 208?; Miq. Flor. Ind. Bat. I, 33; Bak. in Flor. Brit. Ind. II, 304. *Albizzia fasciculata* Kurz, Journ. As. Soc. Beng. XLV, 2. 129, excl. syn. *Pithecolobium macrophyllum* Teysm. & Binnend.

Nicobars; Kamorta, *Kurz!* Kedah; Pulo Songsong, *Curtis* 2604! Pahang; Pulo Chugu, *Ridley* 2637! Malacca; *Griffith! Goodenough* 1894! *Maingay* 571! 578! Perak; *Wray* 542! 2666! 4171! *Scortechini*

1159! 1790! *Kunstler* 2326! 3331! 3771! 4799! 4822! 5674! 6637! 10104! PENANG; *fide* Baker. SINGAPORE, *fide* Baker. DISTRIB. Borneo (*fide* Miquel); Java! and Sumatra!

A very common species for which none of our English collectors have cited a Malay name; Hasskarl and Miquel give the Javanese name as "*Kitjang.*"

This is certainly the *P. fasciculatum* alike of Baker and of Miquel and is the *Albizzia fasciculata* of Kurz. Mr. Baker moreover quotes Wall. Cat. 5268—the basis of Bentham's species, and Wall. Cat. 5270 B. from Singapore as the same. There is unfortunately no example of either of these Wallichian numbers at Calcutta though there are examples both of the Griffithian and the Maingayan Malacca sheets named *P. fasciculatum* by Mr. Bentham himself. The original description given by Mr. Bentham states that the pinnæ of *P. fasciculatum* are 1-jugate, and the account of the species being incomplete in other respects it seems better to treat the identity of Bentham's plant with Hasskarl's one as doubtful. As regards Hasskarl's plant no dubiety is possible; his description is very complete and accurate and there is besides an authentic example of his species in the Calcutta Herbarium. Since in any case Hasskarl's name conserves the oldest specific epithet, it may be better to continue its use even if it should turn out that Bentham's *P. fasciculatum* is really the same thing.

Mr. Kurz's identification of *P. macrophyllum* T. & B., with this species cannot be sustained, for Teysmann's tree is a very distinct one with pods lobed as in *P. lobatum* though with leaves very different from those of *P. lobatum*; the leaflets while much larger than, considerably resemble those of *P. ellipticum*. Mr. Kurz's notice of *P. macrophyllum* T. & B., in 1876, appears to be the earliest mention of the plant. As another species from America, *P. macrophyllum* Spruce, was published in 1875, it is necessary to re-name Teysmann's plant *P. Teysmanni*.

By a *lapsus calami* the *Index Kewensis* gives *Inga elliptica* Bl. as the name, *Pithecolobium ellipticum* Hassk. as a synonym, for our species; the reverse is the actual state of affairs. The tree has not been sent to Calcutta from Penang or from Singapore during recent years.

9. PITHECOLOBIUM KUNSTLERI Prain. A tree 20–30 feet high, with spreading branches; branchlets slightly pubescent, stem 8–12 in. thick, bark brown. *Leaves* evenly 2-pinnate, rachis puberulous 1·5–2·5 in. long, with 1 or 2 large elliptic glands some distance below the bases of the 1 or 2 pairs of pinnæ; rachises of terminal pinnæ 4 in. long with large glands some distance below the bases of the 3 pairs of leaflets, basal rachises when present ·5 in. long with a gland some distance below the 1-jugate leaflets; leaves in the inflorescence sometimes small with short 1-jugate pinnæ and small 1-jugate leaflets; leaflets ovate with rounded bases and rather long caudate-acuminate blunt apices, pale yellowish-green, glabrous shining above, dull uniformly sparsely adpressed-puberulous beneath, distal pair 3–4·5 in. long, 1–2 in. wide, proximal 1–2 in. long, ·5–1 in. wide; those of the basal pinnæ 1·5–2·5 in. long, 1–1·5 in. wide; petiolules puberulous, ·15 in. long. *Flowers* in 4–8-fld. heads ·5–·75 in. across, on puberulous pedicels ·5 in. long, sparsely racemose, singly or 2–3 together in axils of bracts or subumbellate or

corymbose at the ends of branchlets 1–2 in. long, disposed in lax terminal panicles extending into the upper leaf-axils, 6–12 in. long, 4–8 in. wide. *Calyx* sessile, tubular, ·15 in. long, densely pubescent externally, teeth short triangular; the bracteoles small spathulate, pubescent. *Corolla* white, ·5 in. long. densely silky externally, tube narrowly funnel-shaped, teeth lanceolate ·12 in. long. *Filaments* at base united in a white tube puberulous outside, as long as that of corolla, free portion glabrous bright-yellow, 1·25 in. long. *Ovary* very long, stipitate, pubescent. *Pod* with a puberulous stipe ·75 in. long, dehiscent along the lower suture, spirally twisted, 8–10 in. long, ·6 in. wide; valves thinly coriaceous puberulous, not sinuate between the seeds. *Seeds* 8–10, ovate, their long axis parallel with sutures, ·7 in. long, ·4 in. wide, compressed, testa pale-brown, crustaceous, shining.

Perak; at low elevations, *Kunstler* 7875! *Scortechini* 178! Johore; *Lake & Kelsall* 4072! Distrib. Borneo.

A very distinct species; more nearly related to the Indian *P. bigeminum* than to any Malayan species but easily distinguished by its large florets and its long-stipitate pod.

10. Pithecolobium contortum Mart. in Flora XX, 2. Beibl. 115. A tree 15–30 feet high, with spreading grey-pubescent terete or slightly compressed branches, stem 4–6 in. thick, bark dark-brown. *Leaves* evenly 2-pinnate; rachis terete, pubescent, 4–8 in. long, petiolar portion 2 in. long with a large gland below the middle, foliar portion with 1–4 small glands below as many pairs of pinnæ; pinnæ usually 5–8-jugate, sometimes as few as 3-jugate, rarely as many as 15-jugate, rachises with 1–2 small sessile glands below bases of end-pairs of leaflets, diminishing downwards, the distal 4–6 in. long, the basal 1·5–2 in.; leaflets of upper pinnæ 15–20-jugate, of lowest 9–10-jugate, oblong or trapezoid, obtuse or subacute at upper angle, base obliquely unilaterally truncate, upper and lower margins subparallel, main nerve diagonal; rigidly papery, pale-green puberulous above, pubescent beneath, ·5–·75 in. long, ·25–·35 in. wide, petiolules 0. *Flowers* in terminal and axillary simple deltoid panicles 1 foot across, with slender main-rachis 8–20 in. long, the filiform pubescent branches 3–8 in. long, bracts small lanceolate, pedicels puberulous ·25–·4 in. long, the sessile florets scattered or sub-aggregated near their tips in the axils of small acute puberulous bracteoles. *Calyx* ·05 in , campanulate, puberulous, teeth triangular. *Corolla* greenish-white, glabrous, ·15 in. long, teeth lanceolate spreading, almost as long as tube. *Filaments* united below in a tube as long as that of corolla, free portion cream-coloured, ·35 in. long. *Ovary* faintly puberulous, stipitate. *Pod* 6–8 in. long, ·5–·7 in. wide, spirally twisted, dehiscing along the lower suture; valves firmly coriaceous, finely pu-

berulous externally, bright orange, within smooth, vermilion, stipe ·2 in. long; slightly sinuate between seeds on lower margin. *Seeds* 8–10, ovate, with long axis across the pod, ·35 in long. ·25 in. wide, ·2 in. thick, testa dark-purple, thin, crustaceous. Benth. in Hook. Lond. Journ. Bot. III, 210; Bak. in Flor. Brit. Ind. II, 305. *Inga contorta* Grah. in Wall. Cat. 5283. *Inga Finlaysoniana* Grah. in Wall. Cat. 5284.

KEDAH; *Ridley* 5223! PENANG; *Porter* (Wall. Cat. 5283)! *Stolizka! Curtis* 19! 264! MALACCA; *Griffith* 1941! *Maingay* 573! *Hervey! Derry* 149! PERAK; *Scortechini* 1658! 1899! *Wray* 2636! 4249! *Kunstler* 1010! 3775! 3889! SINGAPORE; *Finlayson.*

Nearest *P. Clypearia* but very easily distinguished by its terete branches and its sessile glands, as well as by its sessile florets.

11. PITHECOLOBIUM CLYPEARIA Benth. in Hook. Lond. Journ. Bot. III, 209. A tree 25–30 feet high with spreading brown-pubescent angular branches, bark dark-brown. *Leaves* evenly 2-pinnate; rachis angular, puberulous, 2–7 in. long, petiolar portion 1–1·5 in. long with a large shortly stipitate gland just above base, foliar portion with small distinctly stalked glands just below each pair of pinnæ except the lowest, pinnæ usually 3–6- (rarely 8–10-) jugate, their rachises with small stipitate glands between each pair of leaflets except the lowest, diminishing downwards, distal 5–6 in. long, basal 1·5–2 in. long; leaflets of upper pinnæ 5–7-jugate, of lowest 3–4-jugate, trapeziform, wide-triangular at upper angle, base obliquely unilaterally truncate or rounded, upper and lower margins subparallel, main nerve diagonal; rigidly papery, dark-green glabrous or faintly puberulous shining above, glaucous with scattered adpressed hairs beneath, terminal 1·5 in. long, ·75 in. wide, lowest ·5 in. long, ·3 in. wide; petiolules 0. *Flowers* in small subumbellate corymbs ·35–·4 in. across, on short peduncles 3–·5 in. long, solitary or 2–3 vertically superposed above the axils of bracts with a large gland, on angular branchlets 3–4 in. long similarly disposed on the angular main-rachis but with the bracts reduced to an angled petiolule bearing a large bract at its tip; pedicels of florets ·1 in. long, slender, puberulous, their bracteoles minute or obsolete; the whole inflorescence forming a large terminal panicle extending into axils of upper leaves, 15–18 in. long, 10–15 in. wide. *Calyx* campanulate, ·05 in. long, puberulous externally, teeth short deltoid. *Corolla* white, glabrous, ·1 in. long, teeth lanceolate half as long as tube. *Filaments* united at base in a tube shorter than that of corolla, free portion white, ·35 in. long. *Ovary* puberulous stipitate. *Pod* spirally twisted, 4–5 in. long, ·4 in. wide, dehiscing along the lower suture, valves thinly coriaceous, orange outside, red within, glabrous; stipe ·15 in. long; distinctly sinuate between

the seeds on lower margin. *Seeds* 8–10, ovate, with long axis across the pod, ·25 in. long, ·2 in. across, ·15 in. thick, testa dark-purple, thin, crustaceous. Pl. Jungh. 268; Miq. Flor. Ind. Bat, I, 35; Bak. in Flor. Brit. Ind. II, 305. *Mimosa trapezifolia* Roxb. Hort. Beng. 93; Fl. Ind. II, 546. *Inga dimidiata* Hook. & Arn. Bot. Beech. Voy. 181. *Inga Clypearia* Jack, Mal. Miscell. II, 7. 78?; Hook. Comp. Bot. Mag. I, 224; Wall. Cat. 5270A. *Clypearia rubra* Rumph. Herb. Amboin. III, 176 t. 112?

Penang; *Porter* (Wall. Cat. 5270 A)! *Curtis* 209! Prov. Wellesley; *Kunstler* 1612! Pahang; *Ridley* 1476! Singapore; *T. Anderson* 38! *Hullett* 58! 5698! Malacca; *Griffith!* *Maingay* 570! *Hervey!* Perak; *Scortechini* 481! 2024! *Wray* 1889! 2643! Distrib. Sumatra, Java, Moluccas.

This is apt, when its leaflets are unusually small, to simulate *P. contortum* from which it is, however, easily distinguished by its smaller fruits, its pedicelled florets, and its terete branchlets. It is also apt, when its leaflets are unusually large, to simulate *P. angulatum*; as both have angular branches and pedicelled florets the only safe diagnostic character is the nature of the glands, especially those on the partial rachises of the pinnæ; these glands are stipitate in *P. Clypearia*, sessile in *P. angulatum*.

There is just a trace of doubt as to whether this is Rumphius' *Clypearia rubra* since that author figures no glands, or even that it is *Inga Clypearia* Jack, since Jack says there is no petiolar gland on the leaf of his species. Jack's plant is, he says, known in Sumatra as "*Jiring muniet.*"

12. Pithecolobium angulatum Benth. in Hook. Lond. Journ. Bot. III, 306. A tree 25–30 feet high with spreading shortly puberulous angular branches, bark dark-brown. *Leaves* evenly 2-pinnate; rachis angular, puberulous, 3–8 in. long, with a large sessile gland ·5–·75 in. above the base and near the middle of the petiolar portion, foliar portion with smaller sessile glands below the bases of all but the last pair of pinnæ set obliquely on the upper truncate ends of sharp-edged ridges; pinnæ 2–4-jugate, their rachises with similar but small glands just below each pair of leaflets, the distal 6–7 in., the lowest 1–1·5 in. long; leaflets of upper pinnæ 5–8-jugate, of lowest 2–3-jugate, all diminishing downward; terminal leaflets of most of the pinnæ 3·5–6 in. long, 1·25–2 in. wide, ovate-lanceolate, gradually tapering to an acute tip, the base wide-cuneate, the midrib central, the bases of the remainder progressively more obliquely rounded and the midribs progressively more diagonal, proximal leaflets 1 in. long, ·75 in. wide; all membranous, sparsely puberulous above, softly pubescent beneath when young; thinly subcoriaceous, dark-green glabrous shining above, dull puberulous beneath when mature, lateral nerves 5–7 pairs rather prominent beneath; petiolules ·07 in. long. *Flowers* in small subumbellate corymbs ·5 in. across, on short peduncles ·75 in. long, fascicled

in axils of small gland-bearing bracts on angular branchlets 4–10 in. long, themselves fascicled in axils of bracts with a large basal gland and a foliar simply-pinnate rudimentary lamina, so as to form a terminal panicle extending into axils of upper leaves, 15–20 in. long, 12–18 in. wide; pedicels of florets ·2–·25 in. long, bracteoles minute or obsolete. *Calyx* puberulous, campanulate, ·05 in. long, teeth short acute. *Corolla* pale-yellow or white, ·2 in. long, tube infundibuliform, teeth lanceolate half as long; uniformly sparingly silky. *Staments* united in a tube nearly as long as that of corolla, filaments white or faintly tinged with pink, ·5 in. long. *Ovary* puberulous, shortly stalked. *Pod* spirally twisted, 7–8 in. long, ·7 in. wide, dehiscing along the lower suture, valves firmly coriaceous, red opposite the seeds elsewhere orange and puberulous externally, red and glabrous within; distinctly sinuate between the seeds on the lower margin, stipe very short. *Seeds* 8–10, ovate-oblong, ·5 in. long, ·35 in. wide, ·2 in. thick, testa dark-purple, dull, thin, crustaceous. Miq. Flor. Ind. Bat. I, 34; Bak. in Flor. Brit. Ind. II, 306. *Mimosa heterophylla* Roxb. Hort. Beng. 40; Flor. Ind. II, 545. *Inga acutangula* Grah. in Wall. Cat. 5271. *Pithecolobium acutangulum* Miq. Flor. Ind Bat. Suppl. 282.

Andamans; very common. Nicobars; *King's Collector!* Penang; *Wallich* 5270 C! *Curtis* 489! Malacca; *Derry* 552! 971! *Maingay* 569! Perak; *Scortechini!* *Wray* 1102! Selangor; *Kunstler* 8669! Singapore; *Hullett* 802! *Kidley* 5576! 6407! *Goodenough* 289! Distrib. Eastern Himalaya, Assam, Burma, Sumatra.

A rather variable species, with two leading types, hardly, however, to be distinguished even as varieties owing to the number of intermediate forms that occur. Of these, (α.) *heterophylla*—the original plant of Roxburgh with large terminal leaflets—extends from the Himalaya to Chittagong, the Andamans and Sumatra. This is very uniform in character and constitutes both *Inga acutangula* Grah. (*Wall. Cat.* 5271), and *Pithecolobium acutangulum* Miq., although it happens that Miquel when describing *P. acutangulum* conceived it to be different from *Inga acutangula*. The other plant, (β.) *intermedia*—with smaller terminal leaflets and usually more numerous pinnæ and leaflets—extends from Upper Burma east of the Irrawaday though the Shan Plateau to Tenasserim, the Malay Peninsula and Java. This is less uniform than the preceding and often has leaflets so like those of *P. Clypearia* that it can only be safely distinguished by its longer pedicels and sessile glands. This is the plant of *Wall. Cat.* 5270 C, from Penang, and is the *Pithecolobium angulatum* of Miquel as opposed to that author's *P. acutangulum*. *P. angulatum* Benth., like *P. angulatum* as defined in this paper, includes both plants.

Order XXXIX. ROSACEÆ.

Herbs, shrubs or trees. *Leaves* stipulate, rarely opposite, simple or compound. *Flowers* usually bisexual and regular (very irregular in *Chrysobalaneæ*). *Calyx-tube* free or adnate to the ovary, limb usually

5-lobed, often bracteolate, imbricate or valvate. *Petals* 5, or 0, inserted under the margin of the disc, deciduous, usually imbricate. *Disc* lining the calyx-tube or forming a ring at its base. *Stamens* perigynous, indefinite (rarely 1, 5 or 10) in one or many series, often connate and unilateral in *Chrysobalaneæ*; filaments subulate or filiform, usually incurved in bud; anthers small, didymous. *Ovary* of one or more free or connate carpels, with free or connate basal lateral or subterminal styles; stigmas simple, penicillate or capitate; ovules 1 or more in each carpel. *Fruit* variable, consisting of achenes or berries or drupes, rarely capsular. *Seeds* erect or pendulous, testa membranous or coriaceous, albumen 0; cotyledons large, plano-convex; radicle short.—DISTRIB. About 1,200 species, found in all climates and countries, but chiefly in the temperate.

Of the ten tribes into which this order is subdivided by Messrs. Bentham and Hooker in their *Genera Plantarum*, only four are (as yet) represented by specimens from the Provinces within our area, and these four tribes are represented by only six genera which Sir Joseph Hooker (in his Flora of British India) distinguishes as follows :—

Tribe I. CHRYSOBALANEÆ. *Flowers* usually irregular. *Carpel* 1; style basal; ovules 2, ascending. *Fruit* a drupe. *Radicle* inferior.—Trees or shrubs with simple quite entire leaves.

Calyx-tube elongate. Stamens many, united in a phalange. Ovary 2-locellate ... ... 1. PARINARIUM.

Calyx-tube short. Stamens 2. Ovary 1-celled ... ... 2. PARASTEMON.

Tribe II. PRUNEÆ. *Flowers* regular. *Carpel* 1, rarely 2; style subterminal, rarely basal; ovules 2, pendulous. *Radicle* superior.—Trees or shrubs with simple usually serrated leaves.

Calyx 5-lobed. Petals 5, large, glabrous. *Carpel* solitary, fruit drupaceous ... ... 3. PRUNUS.

Calyx 5–10-toothed. *Petals* 5 and minute, or absent. *Carpel* 1. *Drupe* coriaceous, usually elongated transversely ... 4. PYGEUM.

Tribe III. RUBEÆ. *Flowers* regular. *Calyx* ebracteolate. *Stamens* very numerous. *Carpels* many; styles sub-basal or ventral; ovules 2, collateral, pendulous. *Fruit* of many dry or fleshy carpels, not included in the calyx-tube. *Radicle* superior.—Usually shrubs, often with compound leaves ... ... 5. RUBUS.

Tribe IV. POMEÆ. *Flowers* regular. *Calyx-tube* (or the apex of the peduncle) becoming fleshy after flowering, and enclosing the carpels. *Stamens* numerous. *Ovules* 2 or more, ascending. *Fruit* a pome or berry, with 2–5 bony or coriaceous 1-seeded stones; shrubs or trees ... ... 6. PYRUS.

1. PARINARIUM, Juss.

Trees. *Leaves* simple, alternate, evergreen, quite entire. *Flowers* hermaphrodite, in panicles or corymbose racemes, 2-bracteolate, white or pink. *Calyx-tube* oblong, campanulate, turbinate, or funnel-shaped;

lobes 5, thick, subequal, imbricate. *Petals* 5, sessile or clawed, deciduous. *Stamens* 6–30, the filaments united into an incomplete ring at the base, or connate into an unilateral bundle, all perfect or some without anthers. *Carpel* 1, adnate to one side of the calyx-tube, 2-celled, rarely 2-seeded; style basal, filiform; ovules 2 collateral, or 1 erect. *Drupe* spherical, oblong, obovoid or ovoid, with a 1–2-celled, 1–2-seeded, woody or bony or rarely coriaceous pericarp. *Seeds* erect, testa membranous, cotyledons large fleshy, radicle small inferior. DISTRIB. About 50 species, natives of the tropics of both worlds.

Calyx-tube villous inside. Fruit 2-celled, more than ·5 in. long; the pericarp woody, bony or crustaceous.
- Leaves rusty-grey or dirty white beneath, with numerous spreading parallel stout nerves; stamens 8–10, not united in a phalange.
  - Leaves with 10–12 pairs of main nerves, rusty-pubescent beneath ... ... 1. *P. costatum.*
  - Leaves with 15–18 pairs of main nerves, pale, areolate and puberulous beneath ... ... 2. *P. polyneurum.*
  - Leaves with 25–30 pairs of main nerves, pale, obliquely areolar and puberulous on the nerves beneath... 3. *P. oblongifolium.*
- Leaves glabrous beneath or with only a few strigose hairs on the midrib near its base; main nerves 10–16 pairs, always spreading.
  - Flowers in spikes, sessile, solitary.
    - Stamens about 10; fruit about 1 in. in diam. ... 4. *P. spicatum.*
    - Stamens 12–16; fruit several inches in diam. ... 5. *P. Maingayi.*
  - Flowers in racemes or panicles.
    - Leaves subsessile with broad bases; main nerves 12–14 pairs; fruit ovoid, not compressed ... 6. *P. elatum.*
    - Leaves distinctly petiolate.
      - Leaves oblong-lanceolate, narrowed at the base; stamens 10 ... ... 7. *P. asperulum.*
      - Leaves elliptic-oblong, broad at the base; stamens 12–16 ... ... 8. *P. scabrum.*
- Leaves quite glabrous on both surfaces; main nerves 5–7 (rarely 10) pairs, obliquely ascending, never spreading.
  - Flowers straight; petals subequal.
    - Main nerves of leaves 6 or 7 pairs; fruit covered with crustaceous scurf, its cells glabrous inside ... 9. *P. Kunstleri.*
    - Main nerves 7–10 pairs; fruit quite glabrous, its cells sericeous inside ... ... 10. *P. Griffithianum.*
  - Flowers much curved; sepals and petals very unequal 11. *P. heteropetalum.*

Calyx-tube glabrous and lined by the glabrous staminal tube; fruit less than ·5 in. long, quite glabrous; the pericarp thin, leathery... ... ... 12. *P.? nitidum.*

1. PARINARIUM COSTATUM, Blume Mel. Bot. (1855) Pt. 1. A small tree; young branches slender, deciduously puberulous, the bark pale

and minutely lenticellate. *Leaves* coriaceous, ovate-elliptic or ovate-lanceolate, shortly and obtusely acuminate, the base rounded or cuneate; upper surface glabrous and shining except the pubescent midrib, the lower pale brown when dry, reticulate and covered, except the 10 or 12 pairs of conspicuous slightly ascending glabrous main nerves, with a thin layer of cobwebby hair; length 1·5–3 in., breadth ·75–1·25 in.; petiole ·25 in., pubescent. *Panicles* axillary, longer than the leaves, with a few distant short few-flowered branches, tawny-tomentose. *Flowers* nearly ·25 in. long, on short pedicels, solitary or in cymes of three. *Calyx-tube* densely puberulous outside, internally with a line of subulate processes at the throat and a broad belt of deflexed silky hair, the ovate lobes shorter than the tube. *Petals* thin, obovate, clawed, longer than the calyx-lobes, sparsely pubescent. *Stamens* about 8, half of them anantherous, the filaments villous. *Pistil* 1, the ovary villous. *Fruit* oblong, blunt, slightly compressed, with many pale scurfy patches, slightly more than 1 in. long and ·65 in. broad. Miq. Fl. Ind. Bat. Vol. I, Pt. 1, 354; Hook. fil. Fl. Br. Ind. II, 311 (excl. syn. *P. sumatranum*, Benth. and Kurz's *Petrocarpa sumatrana*); Jack Mal. Misc. II, VII, 67. *Elæocarpus? punctatus*, Wall. Cat. 2676.

Malacca; *Maingay* 621, 621/2. Penang; *Curtis* 259, 2163. Perak; *King's Collector* 5227. Singapore; *Ridley* 398.

2. Parinarium polyneurum, Miq. Fl. Ind. Bat. Suppl. 306. A tree 60 to 100 feet high; young branches slender, pale brown, profusely lenticellate, puberulous. *Leaves* coriaceous, oblong or ovate-oblong, rather bluntly acuminate; the base rounded, eglandular; upper surface glabrous, shining; the lower pale, areolate, puberulous; main nerves 15 to 18 pairs, spreading, prominent beneath; length 3 to 5 in., breadth 1·35 to 2 in. *Panicles* axillary and solitary, or terminal and in clusters of 2–4, rather shorter than the leaves when in flower, longer in fruit, hoary-tomentose; the branches short, rather crowded, the ultimate branchlets cymosely 3-flowered; bract shorter than the calyx-tube, oblong, obliquely acute, tomentose. *Flowers* ·25 in. long, on very short pedicels. *Calyx* infundibuliform, tomentose outside, deflexed-villous inside; the lobes lanceolate, acuminate, pubescent on the inner face. *Petals* as long as the calyx-lobes, oblong, slightly dilated upwards, obtuse, not clawed at the base, glabrous. *Stamens* 10, shorter than the petals, all bearing anthers. *Ovary* sericeous. *Style* glabrous. *Fruit* oblong, compressed, obtuse, slightly tapered to the base, covered with a dense layer of tawny scurf, about 2 in. long when ripe and 1·2 in. across, 2-celled; pericarp crustaceous, very hard, ·25 in. thick.

Malacca; *Griffith*, *Maingay* 622. Perak; *King's Collector* 4624, 6087. Distrib. Sumatra.

3. PARINARIUM OBLONGIFOLIUM Hook. fil. Fl. Br. Ind. II, 309. A tree 50–70 feet high; young branches lenticellate, deciduously puberulous. *Leaves* very coriaceous, oblong- or oblong-elliptic, the apex subacute, the base rounded; upper surface glabrous and shining, the lower pale with oblique areolae, puberulous on the nerves and midrib; main nerves 25–30 pairs, stout, oblique, rather straight; length 5·5–8·5 in., breadth 1·85–3 in.; petiole ·35–·65 in., stout. *Panicles* axillary and terminal, solitary, many-flowered, spreading, minutely tawny-tomentose, 3–6 in. across. *Flowers* ·2 in. long, on very short pedicels; bracts ovate-rotund, concave, acute, tomentose. *Calyx-tube* infundibuliform, subgibbous, minutely tomentose outside, deflexed-villous inside, lobes broadly ovate, acute. *Petals* not longer than the calyx-lobes, spathulate, glabrous. *Stamens* 8, about as long as the petals. *Ovary* villous; style sparsely pubescent. *Fruit* elliptic-ovoid, obtuse, compressed, densely coated with grey hard scurf, 2·75 in. long and 1·5 in. in diam.

MALACCA; *Griffith, Maingay* 623. PAHANG; *Ridley* 5026. PERAK; *King's Collector* 10369, 10422.

A species readily distinguished by its large oblong fruit, large leaves with numerous parallel nerves prominent on the lower surface, and small flowers with the stamens and petals not longer than the calyx-lobes. It approaches *P. sumatranum*, Miq. in its leaves, but the under-surface in that species is uniformly and minutely tomentose, whereas in this the under surface has very peculiar oblique areolae and there is no tomentum. The fruits of the two differ also in size.

4. PARINARIUM SPICATUM, King, n. sp. A tree 60 to 80 feet high; branches slender, dark-coloured, puberulous. *Leaves* coriaceous, elliptic-ovate, shortly and broadly acuminate, the base rounded but slightly produced along the sides of the upper half of the petiole; both surfaces reticulate when dry; the upper glabrous, shining; the lower slightly dull and paler, minutely pustulate, glabrous except the sparsely strigose midrib; main nerves about 12 pairs, spreading, faint; length 2–3 in., breadth ·85–1·6 in., petiole ·1 in. *Spikes* axillary and terminal, about as long as the leaves, in clusters of 2 or 3, everywhere tawny-pubescent with many adpressed hairs intermixed. *Flowers* ·5 in. long, solitary, rather distant, sessile, bibracteate at the base; the bracts much shorter than the flower, oblong, subacute, tomentose. *Calyx-tube* narrowly funnel-shaped, slightly gibbous, tomentose outside, deflexed-villous in its upper part inside; its lobes broadly oblong, obtuse, deflexed. *Petals* longer than the calyx-lobes, broadly elliptic, very obtuse, glabrous. *Stamens* about 10, longer than the petals, shorter than the pistil; the filaments glabrous, united at the very base. *Ovary* sericeous; style sparsely hairy in its lower half, otherwise glabrous. *Fruit* about 1 in. in diam., suborbicular, slightly compressed, densely covered with a yellowish crustaceous scurf, 2-celled; the pericarp ·2 in. thick, tomentose inside.

Perak; *King's Collector* 6145, 10326.

This approaches *P. costatum*, Bl. in the shape and nervation of its leaves; but is distinguished from that species by its spicate inflorescence and solitary flowers. Its fruit also is more orbicular than that of *P. costatum*.

5. Parinarium Maingayi, King n. spec. A tree; young branches with dark bark bearing a few oblong lenticels, glabrous. *Leaves* very coriaceous, elliptic-oblong, very shortly and obtusely acuminate, the base rounded; both surfaces glabrous and with minutely papillate reticulations, the upper shining, the lower dull and rather pale; main nerves 10–12 pairs, spreading, curving, rather prominent beneath; length 3–4·5 in., breadth 1·35–2 in.; petiole ·3 in., stout. *Spikes* usually in pairs, axillary, shorter than the leaves, pedunculate, minutely tomentose. *Flowers* sessile, ·3 in. long, or (to the apex of the stamens) ·6 in.; bracts shorter than the calyx-tube, broadly ovate-obtuse, tomentose. *Calyx-tube* infundibuliform, tomentose outside, deflexed-villous inside; the lobes short, broad, rounded very obtuse. *Petals* longer than the calyx-lobes, obovate, sessile, glaberulous. *Stamens* 12–16, much longer than the petals, decurved. *Ovary* densely wooly; style long, slender. *Drupe* spherical, the size of a small apple (Hooker); the pericarp thick and bony, smooth on the inner surface, furrowed on one side. *Seed* large, with a thin testa. *P. asperulum*, Hook. fil. in Fl. Br. Ind. II, 310 (*not of Miq.*)

Malacca; *Maingay* 618, and probably also *Griffith* 2049.

This in some respects resembles *P. asperulum* and *P. scabrum*, but differs from both in its much larger fruit and sessile flowers, and from the former also in the venation of its leaves.

6. Parinarium elatum, King n. spec. A tree 60–120 feet high; young branches as thick as a quill, blackish-cinereous, lenticellate. *Leaves* thickly coriaceous, subsessile, elliptic to ovate-elliptic, acute or shortly acuminate; the base broad, rounded or minutely cordate; upper surface glabrous, shining, the main nerves and midrib slightly prominent; lower surface darker and duller than the upper when dry, glabrous except a few strigose hairs at the base of the very prominent midrib; the 12–14 pairs of spreading curved main nerves very prominent; length 4·5–7·5 in., breadth 1·5–3·25 in.; petiole only about ·15 in., strigose. *Panicles* axillary, solitary or several together, shorter than the leaves, with few short rather distant branches, or unbranched, minutely tomentose, few-flowered; bracts 2 at the base of each flower, slightly shorter than the calyx-tube, elliptic, acute, adpressed-pubescent. *Calyx-tube* funnel-shaped, adpressed-tomentose outside, deflexed-villous inside at the mouth; the lobes unequal, nearly as long as the tube, broadly ovate, subacute, very tomentose on both surfaces. *Petals* longer and

more narrowed than the calyx-lobes, subacute, glabrous. *Stamens* longer than the petals, glabrous. *Ovary* sericeous, the style glabrous in its upper half. *Fruit* ovoid, not compressed, crustaceous-scurfy outside, pale-brown, 2-celled, 1·15 in. long and ·8 in. in diam.; the pericarp crustaceous, ·2 in. thick, minutely hairy inside.

Perak; *King's Collector*, 3436, 3711.

A species resembling *P. oblongifolium*, Hook. fil. in its leaves which however have fewer nerves; but differing greatly from that species both in its inflorescence and flowers.

7. Parinarium asperulum, Miq. Fl. Ind. Bat. Suppl. 307. A tree 50–80 feet high; young branches slender, with dark-coloured bark and a few scanty deciduous pale flexuous hairs. *Leaves* thinly coriaceous, oblong-lanceolate, tapering gradually to the obtusely acuminate apex; the blade narrowed slightly to the base and continued along the sides of the upper half of the short petiole; both surfaces glabrous and with minute pitted papillæ, the lower paler and more reticulate; main nerves 10–16 pairs, faint, spreading; length 3–5·5 in., breadth 1–1·65 in., petiole ·25 in. *Racemes* or panicles axillary or terminal, solitary, half as long as the leaves, minutely tomentose; the flowers about ·3 in. long, (·6 in. to the apex of the exserted stamens); the pedicels ·1 in. long; bracts at the base of the flower 2, obtuse, tomentose. *Calyx* densely tomentose; the tube clavate, deflexed-pilose inside; the lobes broadly ovate, subacute, imbricate. *Petals* longer than the calyx-lobes, obovate-oblong, not clawed, glabrous. *Stamens* about 10; the filaments glabrous, united at the base. *Ovary* densely and the style sparsely villous. *Fruit* sub-ovoid, compressed, very obtuse, with a vertical groove along the two sides, minutely rugulose and densely covered with hard pale-brown scurf, nearly 1 in. long and ·6 in. broad, 2-celled; pericarp thick, bony, hairy inside.

Penang; *Curtis*, 203. Pahang; *Ridley*, 2603. Perak; *King's Collector*, 3537, 7568. Distrib. Sumatra.

There is an original and authentic specimen of *P. asperulum* in the Calcutta Herbarium collected by Teysmann in Sumatra, and it agrees absolutely with the Penang and Perak specimens above quoted. The species is near to *P. scabrum*, Hassk., but has fewer stamens and smaller and differently shaped leaves. The ripe fruit is also presumably much smaller, for specimens of unripe fruit of *P. scabrum* are as large as specimens of ripe fruit of this species.

8. Parinarium scabrum, Hassk. Cat. Hort. Bot. Bogor. (1844), 269. A tall tree; young branches dark-coloured and with a few scattered hairs. *Leaves* coriaceous, elliptic-oblong, shortly and bluntly acuminate; the base broad, rounded or very slightly cuneate, eglandular; both surfaces glabrous, shining, strongly but minutely reticulate, and with numerous small perforate-topped papillæ especially on the reticulations; main

nerves 13–15 pairs, slender, spreading, with a few shorter intermediate; length 4–6 in., breadth 1·75–2·75 in., petiole ·2 in. *Panicles* (sometimes reduced to racemes) axillary and terminal, often two or three together, much shorter than the leaves, adpressed-pubescent; the flowers not numerous, collected near the ends of the branches; bracts oblong, obtuse, pubescent, shorter than the calyx-tube. *Flowers* (from the point of insertion) ·5 or ·6 in. long; the calyx-tube merged in the pedicel, clavate, pubescent outside, deflexed-villous inside. *Calyx-lobes* ovate-rotund, undulate, subacute, imbricate, minutely tomentose on both surfaces. *Petals* larger than the calyx-lobes, obovate, clawed, glabrescent. *Stamens* 12–16; the filaments united at the base into a tube open at one side, much curved, deflexed. *Ovary* lanate, 2-celled. *Style* sparsely pubescent, shorter than the stamens. *Fruit* ovoid, obtuse, slightly compressed, vertically grooved, rough and covered with pale scurf; pericarp bony, thick, 2-celled, the cells pubescent, 1 in. long and ·6 in. broad (not ripe). Hassk. in Flora (1844), p. 585. Miq. Fl. Ind. Bat. Vol. I, pt. I, 354 t. V.

Perak; *Scortechini* 1981.

Only once collected in Perak. This species is very closely allied to *P. glaberrimum*, Hassk. and I greatly doubt whether the two should be kept separate. The latter species is described at great length by Hasskarl in the volume of Flora for 1844, p. 533; but I have seen only one authentic specimen, and that consists only of leaves. *P. scabrum*, on the other hand, is described by Hasskarl in nine words: but of it there are in the Calcutta Herbarium several excellent authentic flowering specimens. And with these Scortechini's specimens numbered 1981 agree absolutely.

9. Parinarium Kunstleri, King n. spec. A tree 50–80 feet high; young branches slender, cinereous, glabrous. *Leaves* coriaceous, oblong-lanceolate, tapering from about the middle to each end, the apex acuminate; the base acute, eglandular; both surfaces glabrous and rather dull, the lower with wide slightly conspicuous reticulations and minute papillæ; main nerves 6 or 7 pairs, curving upwards, only slightly conspicuous on the lower surface; length 3·25–4·5 in., breadth 1·15–1·65 in., petiole ·25–·3 in.,; lobes of the *calyx* oblong, obtuse, tomentose on both surfaces. *Petals* longer than the calyx-lobes, obtuse, glabrous. *Stamens* about 20 or 30, glabrous; the filaments united by their bases, longer than the petals. *Style* as long as the stamens, villous. *Fruit* oblong, ovoid, slightly compressed, obtuse, tapering slightly to the base, 1·25 in. long and about ·9 in. broad, 2-celled, densely covered with pale-brown crustaceous scurf; pericarp crustaceous, smooth inside.

Perak; *King's Collector* 3715, 3745, 6917.

I have seen no specimens of this in flower. The description of the parts of the flower above given has been taken from withered remains found persisting at the base of some of the ripe fruits. In its leaves this resembles *P. asperulum*,

Miq., but there are only 6 or 7 pairs of nerves as against 10–16 pairs in that species. The fruits of this are moreover slightly larger and much more globular, and the interior of the cells is glabrous; whereas in those of *P. asperulum* the cells are hairy inside.

10. Parinarium Griffithianum, Benth. in Hook. Niger Flora, 334. A large tree (Curtis); young branches rather stout, with dark lenticellate bark. *Leaves* coriaceous, oblong-lanceolate or elliptic-lanceolate, caudate-acuminate, narrowed at the base to the short petiole; both surfaces glabrous, the upper very polished, the lower duller; main nerves 7–10 pairs, curving upwards, faint; length 3·5–6 in., breadth 1·2–2·25 in., petiole ·25–·35 in. *Panicles* axillary and terminal, pedunculate, longer than the leaves, pyramidal, nearly glabrous, the branches sparsely-flowered; bracts, if any, deciduous (not seen). *Flowers* ·5 in. long, on short pedicels. *Calyx-tube* narrowly funnel-shaped, hoary-pubescent, the lobes rotund. *Petals* broadly oblong, concave, subglabrous, about as long as the calyx-lobes. *Stamens* 20–30; the filaments longer than the petals, united at the base into a short tube. *Ovary* very tomentose; the style longer than the stamens, glabrous. *Fruit* narrowly ellipsoid or slightly obovoid, blunt, glabrous, 2-celled, about 1·5 in. long and ·75 in. in diam.; pericarp crustaceous, ·15 in. thick, lined with dense silky pubescence. Hook. fil. Fl. Br. Ind. II, 310. *P. multiflorum*, Miq. Fl. Ind. Bat. Vol. I, Pt. 1, 356. *Maranthes multiflora*, Korth. Verh. Nat. Gesch. Bot. 259, t. 70.

Malacca; *Griffith* 2047/2; *Maingay* 620. Pahang; *Ridley* 1354. Kedah; *Curtis*. Singapore; *Ridley* 4792. Penang; *Curtis* 1514, 2416.

Griffith's specimen 2047/2, which is the type of the species, has more polished leaves and an opener panicle than the other specimens quoted above. But I can detect no difference in the flowers. Griffith's specimen has no fruit, and the whole material is imperfect. It may turn out that there are really two species included under *P. Griffithianum*.

11. Parinarium heteropetalum, Scortechini MSS. A tree 60–80 feet high; young branches rather slender and with rather rough cinereous glabrous bark. *Leaves* coriaceous, eglandular, oblong-lanceolate, tapering from the middle to both ends, the apex acuminate, the base acute; both surfaces glabrous, rather dull when dry, the lower very minutely punctate; main nerves faint on both surfaces, 5 or 6 pairs, oblique, ascending; length 3·5–4·5 in., breadth 1–1·6 in., petiole ·35 in., stout. *Panicles* axillary and terminal, about one-third to one-half as long as the leaves, with short branches, everywhere rusty-pubescent; bract at the base of the flowers solitary, lanceolate, tomentose. *Flowers* ·5 in. long, sessile. *Calyx-tube* curved, narrowly tubular below the bend and suddenly expanded above it; the lobes thick, concave, reflexed, unequal, from oblong to suborbicular or obovate, everywhere pubescent

or tomentose, the hairs inside the tube not deflexed. *Petals* 5, pink, glabrous, longer than the calyx-lobes, very unequal; the two posterior erect, broadly elliptic, concave, clawed; the three anterior narrowly oblong, revolute, imbricate, flat. *Stamens* 25–30, in a single semi-tubular phalange, as long as the petals, glabrous; the anthers small. *Ovary* villous, 2-celled. *Style* curved, longer than the stamens, villous in the lower, glabrous in the upper half. *Fruit* unknown.

Perak; *Scortechini*, 240, 2040. *King's Collector*, 664, 6899.

A species easily recognised by its curved flowers and very unequal sepals and petals.

12. Parinarium? nitidum, Hook. fil. Fl. Br. Ind. II, 310. A tree 15–40 feet high; young branches very slender, with pale-brown glabrous shining bark. *Leaves* elliptic to elliptic-lanceolate, shortly and bluntly acuminate, the blade much narrowed to the base and continued along the sides of the upper half of the petiole; both surfaces quite glabrous, the upper very shining; the lower slightly dull, paler, almost glaucous when young; main nerves 7–9 pairs, ascending, faint; length 2·25–3·5, rarely 4 in, breadth ·8–1·75, rarely 2 or 2·5 in.; petiole below the winged part ·1–·2 in. *Panicles* slightly shorter or longer than the leaves, hoary-tomentose, axillary and terminal, with short sub-horizontal cymosely 3-flowered branches; bracts oblong, shorter than the flowers, broadly ovate, acute, concave. *Flowers* ·15 in. long and about the same in width at the mouth, subsessile. *Calyx* widely funnel-shaped, the lobes broadly triangular, acute; the exterior hoary-tomentose; the interior lined by the subglabrous tube formed by dilated bases of the filaments, and with a thickened hairy process on the side opposite the 8–10 anthers. *Petals* longer than the calyx-lobes, oblong-obtuse, incurved. *Ovary* densely sericeous, the style short. *Fruit* obovoid-rotund, glabrous, 1-celled, ·35 in. long and about ·25 in. in diam.; the pericarp thin, leathery, densely woolly inside.

Malacca; *Griffith* 2047/1, *Maingay* 619. *Derry* 189, 1180. Perak; *King's Collector* 8599, 8680, 8711. Penang; *Curtis* 147, 853; *King's Collector* 1274, 1472.

Very few of the specimens which I have seen of this have fruit, and of these not one has a seed. When the material has been fully completed by the receipt of seeds, I think a new genus might with advantage be formed for this plant; for it differs from the other species of *Parinarium* here described in having a cushion-like process in its calyx-tube the other parts of which are lined by the tube formed by the lower part of the dilated filaments. It also has a small 1-celled fruit with a thin leathery pericarp.

2. Parastemon, A. DC.

A shrub or small tree. *Leaves* simple, alternate, evergreen, quite

entire. *Flowers* polygamo-dicœcious, minute, racemose, minutely bracteolate. *Calyx-tube* shortly campanulate; lobes 5, imbricate. *Petals* 5, (or 6), oblong, deciduous. *Stamens* 2 perfect unilateral, and several imperfect. *Carpel* 1, adnate to one side of the calyx-tube, 1-celled; style basilar; ovules 2, erect. *Fruit* oblong, coriaceous, 1-celled, 1-seeded, indehiscent. *Seed* solitary, erect; testa membranous, pubescent; cotyledons fleshy, radicle inferior, plumule hairy.

Parastemon urophyllum, A. DC. in Ann. Sc. Nat. Ser. 2. XVIII, 208. A tall tree with pendulous habit, young branches very slender, glabrous. *Leaves* coriaceous, ovate-lanceolate to lanceolate, sometimes slightly oblanceolate, obtusely caudate-acuminate, the base much narrowed; both surfaces glabrous, the lower minutely lepidote; main nerves very faint, 4–6 pairs, oblique, the intermediate almost as distinct; length 2·5–3 in., breadth ·85–1·5 in., petiole ·25 in. *Racemes* nearly as long as the leaves, slender, axillary, glabrous, usually solitary but sometimes 2 together. *Flowers* ·15 in. long to the apex of the stamens, on short pedicels each with a minute concave ovate bracteole at its base. *Fruit* cylindric, tapering a little to each end, glabrous, ·45 in. long, and ·25 in. in diam.

In all the provinces, except the Andamans.

3. Prunus, Linn.

Shrubs or trees. *Leaves* alternate, simple, quite entire, or serrate or crenate or glandular-serrulate; petiole often 2-glandular. *Flowers* white or red, solitary, fascicled, corymbose or racemed. *Calyx* deciduous in fruit; lobes 5, imbricate. *Petals* 5. *Stamens* 15–60, perigynous, inserted in the mouth of the calyx-tube, filaments free. *Carpel* 1; style terminal; ovules 2, collateral, pendulous. *Drupe* with an indehiscent or 2-valved, 1-seeded, smooth, or rugged stone. *Seed* pendulous, testa membranous or coriaceous, albumen scanty or 0. Distrib. N. temp. regions, rare in the tropics; species about 80.

Prunus martabanica, Kurz For. Flora Burma, I, 434. A tree 40–60 feet high; all parts, except the inflorescence, quite glabrous; young branches rather slender, lenticellate. *Leaves* membranous, elliptic-oblong to ovate-oblong, acuminate, suddenly slightly and often unequally narrowed to the base, with minute black dots on the lower surface; main nerves 5–7 pairs, spreading, very faint; length 3–6 in., breadth 1·65–2·5 in.; petiole ·4–·75 in., eglandular. *Racemes* solitary or in pairs, from the axils of fallen leaves and about as long as the leaves, pubescent. *Flowers* rather distant, about ·35 in. in diam. on puberulous pedicels ·3–·35 in. long. *Calyx-tube* campanulate, tomentose; the lobes erect, ovate, subacute. *Petals* orbicular, about ·1 in. long, deciduous.

Stamens 60–80. *Ovary* ovoid, glabrous, the style much longer than the stamens, the stigma dilated. *Drupe* cylindric, with a pointed apex and rounded base, glabrous, 1–1·25 in. long; pericarp thin, woody, smooth inside. *Seed* minutely hairy. Hook. fil. Fl. Br. Ind. II, 316. *Cerasus? mariabanica*, Wall. Cat. 4902.

Andaman Islands; *Kurz, King's Collectors.* Distrib. Burma.

Var. *Scortechinii*, King, bases of leaves rounded, main nerves 9-12 pairs; racemes less than half the length of the leaves; flowers ·25 in. in diam.; stamens 30–40, fruit about ·6 in. long.

Perak; *Scortechini* 1782; *King's Collector* 5638.

This variety may possibly prove to be a distinct species. Although differing from the Andamanese and Burmese specimens in the points noted above, the Perak specimens have the same general *facies*.

4. Pygeum, Gærtn.

Evergreen trees or shrubs. *Leaves* alternate, usually quite entire; stipules minute, fugacious, (large and persistent in one species) basal glands 2 or 0. *Flowers* small, racemose or paniculate, sometimes unisexual by want of the ovary. *Calyx-tube* obconic urceolate or campanulate, deciduous; limb 5–15-toothed, often unequally. *Petals* minute, 5–6 in the 5–6-toothed calyx, 0 in the 10–15-toothed, villous or tomentose, rarely glabrous, often undistinguishable from the calyx-lobes. *Stamens* 10–50, in one or more series at the orifice of the calyx-tube; filaments slender, incurved; anthers small. *Carpel* 1, basal in the calyx-tube, ovoid or subglobose; style terminal, slender, exserted from the bud, stigma capitate; ovules 2, collateral, pēndulous. *Fruit* a transversely oblong, obscurely didymous, rarely subglobose drupe; pericarp thin, dry or juicy. *Cotyledons* very thick, hemispheric; radicle minute, superior. Distrib. Species about 30, tropical Asiatic and one African.

Edges of leaves entire :—
- Stipules large and persistent ... ... 1. *P. stipulaceum.*
- Stipules small and fugaceous :—
  - Flowers ·5 in. in diam. ... ... 2. *P. grandiflorum.*
  - Flowers much less than ·5 in. in diam. :—
    - Ovary glabrous :—
      - Racemes not much longer than the petioles :—
        - Leaves 4 or 5 in. long and 2 in. broad, lower surface puberulous; main nerves 7 pairs ... 3. *P. intermedium.*
        - Leaves 1·5–2 in. long and ·65–1·1 in. broad, lower surface deciduously pubescent and rugulose beneath; main nerves 4–6 pairs ... ... 4. *P. Maingayi.*
        - Leaves 3–3·5 in. long, 1–1·4 in. broad, glabrous beneath and subglaucous; main nerves 4 or 5 pairs ... ... 5. *P. lanceolatum.*

Racemes 2 or 3 inches long :—
Flowers ·15 in. long, 6-merous, stamens 30; leaves with 6 or 7 pairs of nerves, their apices much tapered ... ... 6. *P. acuminatum.*
Flowers ·25 in. long, 5-merous; stamens 40 or 50; leaves with 7–10 pairs of nerves, their apices slightly and obtusely acuminate ... ... 7. *P. polystachyum.*
Ovary villous or hirsute :—
Racemes much longer than the petioles (from ·75–1·5 in. long) :—
Leaves glabrous on the lower surface ... 8. *P. Scortechinii.*
Leaves rugulose, the lower surface glabrous except for a few scattered adpressed hairs ... 9. *P. persimile.*
Leaves with short adpressed hairs on the lower surface, not glabrous or rugulose ... ... 10. *P. parviflorum.*
Racemes very little longer than the petioles :—
Lower surfaces of leaves with short adpressed hairs; bases of leaves cuneate, their apices caudate-acuminate ... ... 10. *P. parviflorum.* VAR. *densa.*
Lower surfaces of leaves minutely pubescent with adpressed bristles intermixed with the hairs; bases of leaves rounded, their apices obtuse and emarginate ... ... 11. *P. ovalifolium.*
Lower surfaces of leaves minutely rusty-pubescent, the hairs partly deciduous; leaves with rounded bases and acuminate apices ... 12. *P. Hookerianum*
Leaves glabrous on the under surface ... 13. *P. brevifolium.*
Edges of leaves sinuate-dentate ... ... 14. *P. Griffithii.*

1. PYGEUM STIPULACEUM, King n. sp. A tree; young branches stout, densely rusty-tomentose. *Leaves* very coriaceous, broadly elliptic, acute, the base broad and slightly cordate, the edges revolute; upper surface glabrous, the nerves and midrib deeply depressed, the latter pubescent; lower surface rusty-pubescent especially on the midrib, main and transverse nerves; main-nerves 10–12 pairs, spreading, curving upwards; length 5–7 in., breadth 2·5–3·75 in., petiole ·5 in., very stout and densely rusty-tomentose; stipules persistent, broadly ovate, or caudate, acute, boldly ribbed, puberulous, persistent. *Racemes* in fascicles from the branches below the leaves, 1·25–2 in. long, rusty-tomentose; bracts broadly elliptic, concave, tomentose outside, glabrous inside. *Flowers* ·15 in. long, on pedicels about as long as themselves. *Calyx-tube* campanulate, with 10 short obtuse teeth, tomentose outside. *Petals* 0. *Stamens* about 15, exserted, glabrous. *Pistil* longer than the stamens; ovary villous; style stout, erect, subglabrous; stigma capitate, discoid. *Fruit* unknown.

PERAK; *Scortechini* 11020.

2. Pygeum grandiflorum, King n. spec. A tree 50–70 feet high; all parts, except the inflorescence, glabrous; young branches rather stout. *Leaves* thinly coriaceous, elliptic to oblong-elliptic, sometimes slightly obovate, with an abrupt short blunt point; the base cuneate, eglandular; upper surface shining, smooth, the lower less shining and minutely pustulate; main nerves 8 or 9 pairs, spreading but curving upwards, prominent on the lower surface; length 5–8 in., breadth 2·75–3·5 in., petiole ·75 in. *Panicles* solitary, axillary, nearly as long as the leaves, with a few lax corymbose branches, almost glabrous below, rusty-tomentose towards the apex; bracts broadly ovate, concave, blunt, puberulous. *Flowers* ·5 in. across, on pedicels ·15 in. long; bracteoles near the apex of the pedicels 1 or 2, minute. *Calyx-tube* widely campanulate, short, with 5 broad blunt subreniform lobes tomentose outside. *Petals* 5, much larger than the calyx-teeth (·2 in. long), subrotund to broadly oblong, blunt, reflexed. *Stamens* very numerous, glabrous. *Pistil* slightly longer than the stamens, the ovary pubescent, style puberulous; stigma small, capitate. *Fruit* unknown.

Perak; *King's Collector* 7425.

A very distinct species with large glabrous leaves, and larger flowers than any here described.

3. Pygeum intermedium, King n. spec. A tree 30–40 feet high; young branches dark-coloured, lenticellate, subglabrous. *Leaves* coriaceous, broadly elliptic to oblong-elliptic, the apex acute or shortly acuminate, the base rounded or slightly cuneate; upper surface minutely punctulate, not shining when dry, glabrous except the broad, depressed, pubescent midrib; lower surface puberulous, pubescent on the nerves and midrib; main-nerves 7 pairs, oblique, curved, prominent beneath; length 4–5 in., breadth about 2 in., petiole ·35 in. *Racemes* about ·5 in. long, from the axils of fallen leaves, solitary or several together, densely tawny-tomentose; bracts shorter than the very short pedicels, ovate-obtuse, concave. *Flowers* less than ·15 in. long. *Calyx-tube* widely infundibuliform, with 6 oblong blunt hairy teeth. *Petals* none. *Stamens* about 20, glabrous, exserted. *Pistils* as long as the stamens, glabrous; stigma capitate. *Fruit* subglobular, compressed, crowned by the style, glabrous, ·3 in. long and about ·2 in. thick.

Malacca; *Maingay* 626. Perak; *King's Collector* 3791.

4. Pygeum Maingayi, Hook. fil. Fl. Br. Ind. II, 319. A tree; young branches slender, with dark-coloured glabrous bark. *Leaves* coriaceous, elliptic-lanceolate, acuminate, with slightly cuneate rather broad bases and often with 2 small glands a little above the petiole; the upper surface glabrous, smooth but not shining (when dry); the lower dark-brown in colour and rugulose, deciduously pubescent; main-nerves

4–6 pairs, spreading, curving upwards, rather prominent on the lower, obsolete on the upper surface; length 1·5–2 in., breadth ·65–1·1 in., petiole ·2 in. *Racemes* axillary and extra-axillary, about as long as the petioles, rusty-tomentose; bracts solitary at the base of the pedicels, ovate-acute, concave, tomentose outside, glabrous inside. *Flowers* ·15 in. in diam., on pedicels shorter than themselves. *Calyx-tube* funnel-shaped, its mouth with 6 obtuse villous teeth. *Petals* none. *Stamens* about 16, glabrous, much exserted. *Ovary* small, often abortive; style slender, glabrous. *Fruit* transversely oblong with a sharp mucronate apex, ·25 in. long, and ·35 in. broad.

Malacca; *Maingay* 625. Perak; *King's Collector* 5336; *Scortechini* 217.

This species comes very near *P. lanceolatum*, Hook. fil. It has, however, no petals, whereas *P. lanceolatum* has. The leaves of this in the young state are moreover pubescent, while those of the latter are glabrous at all stages.

5. Pygeum lanceolatum, Hook. fil. Fl. Br. Ind. II, 319. A tree 30 or 40 feet high; young branches slender, dark-coloured, adpressed-puberulous. *Leaves* thinly coriaceous, elliptic-lanceolate, obtusely acuminate; the base cuneate, with 2 narrow glands just above it; both surfaces glabrous, the lower subglaucous and with a few adpressed hairs on the main nerves and midrib; main nerves 4 or 5 pairs, curved, ascending, slightly prominent and dark-coloured on the lower surface; length 3–3·5 in., breadth 1–1·4 in., petiole ·25–·3 in. *Racemes* only about ·5 in. long, axillary and extra-axillary, tomentose; the bracteole at the base of each pedicel sub-orbicular, acute, glabrous inside. *Flowers* on pedicels as long as themselves, ·15 in. in diam. *Calyx-tube* widely campanulate, tomentose externally, glabrous inside and with 10 broad short teeth. *Petals* (if any) deciduous. *Stamens* about 20, much exserted. *Ovary* glabrous, compressed; *style* stout, glabrous, longer than the petals; stigma compressed. *Fruit* transversely oblong, with a slight vertical groove, glabrous, ·3 in. long, and ·4 in. broad, 2-seeded.

Singapore; *Lobb* 328. Penang; *Curtis* 216, 735.

The racemes of this are often very short, almost sessile, and subglobular. It is a very distinct species. I have not been able to discover any petals.

6. Pygeum acuminatum, Colebr. in Trans. Linn. Soc. XII, 360, t. 18. A tall tree; young branches cinereous, glabrous, rough. *Leaves* coriaceous, elliptic to elliptic-oblong, shortly and obtusely caudate-acuminate; the base rounded or slightly cuneate and unequal, often with 1 or 2 obscure glands; upper surface glabrous, shining, the midrib and nerves depressed; lower surface brown when dry, subrugulose, glabrous, dull; main nerves 6 or 7 pairs, curving upwards, prominent (almost winged)

beneath; length 4–6·5 in., breadth 1·75–3·25 in., petiole ·35–·5 in. *Racemes* from the axils of fallen leaves, solitary or several together, 2 or 3 inches long, slender, tawny-pubescent. *Flowers* ·15 in. long, on pedicels ·1 in. long; bracts narrowly oblong, sub-acute, very deciduous. *Calyx-tube* broadly campanulate, ·15 in. wide at the mouth; teeth about 6, narrowly lanceolate. *Petals* 6, oblanceolate, obtuse, sericeous outside. *Stamens* about 30, long-exserted, glabrous. *Pistil* as long as the stamens; ovary glabrous; style slender, straight; stigma discoid-capitate. *Fruit* transversely oblong, slightly compressed, minutely apiculate, glabrous, but slightly rough, ·5 in. long and ·8 in. broad.

Andaman Islands. Distrib. Burma, Chittagong, Assam Range, Eastern Tropical Himalaya.

7. Pygeum polystachyum, Hook. fil. Fl. Br. Ind. I, 320. A tree 30–60 feet high; young branches with dark-coloured glabrous lenticellate bark. *Leaves* very coriaceous, elliptic-oblong, usually with an abrupt obtusely acuminate apex; the base broad or slightly and suddenly cuneate and with 2 large thick glands on its upper surface just above the petiole; upper surface glabrous, shining, pale greenish-brown when dry; the lower brown when dry, dull, minutely rugulose, glabrous; main nerves 7–10 pairs, oblique, rather straight, depressed on the upper and prominent on the lower surface; length 4·5–7 in., breadth 2·5–4 in., petiole ·5 in., stout. *Racemes* (occasionally racemoid panicles) axillary, shorter than the leaves, slender, covered with short scanty rusty pubescence. *Flowers* about ·2 in. long and ·25 in. in diam., on pedicels varying from ·1–·2 in. long; bracts (if any) deciduous. *Calyx-tube* campanulate, ribbed and tomentose externally, glabrescent within; lobes 5, oblong, obtuse, rufous-tomentose. *Petals* 5, like the calyx-lobes. *Stamens* 40–50, much exserted. *Ovary* glabrous; style as long as the stamens, glabrous; stigma dilated, compressed laterally. *Drupe* sub-globular or transversely oblong, bluntly apiculate, ·65 in. long and from ·6–·75 in. broad, glabrous. *Seeds* glaucous.

Malacca; *Maingay* 627. Singapore; *Ridley* 3830, 4453, 4666. Perak; *Scortechini* 2045, 2063. *King's Collector* 5676, 6603, 5676, 6847, 10942; *Wray* 3113, 3384.

This species is very near *P. acuminatum*, Colebr., of which I believe it to be probably only a southern form.

8. Pygeum Scortechinii, King n. sp. A slender tree 40–50 feet high; young branches puberulous, the bark dark-coloured. *Leaves* coriaceous, elliptic to oblong-lanceolate, acute or shortly acuminate; the base cuneate, eglandular; upper surface shining, glabrous except for occasionally a few scattered hairs on the depressed midrib near its base; lower surface pale, not shining, glabrous, minutely rugulose; main nerves

6 or 7 pairs, slender, spreading; length 2–3 in., breadth ·8–1·35 in., petiole ·25–·35 in. *Racemes* solitary, axillary, 1–1·25 in. long, coarsely adpressed rusty-pubescent, bracts (if any) deciduous. *Flowers* ·15 in. long, their pedicels ·1 in. *Calyx-tube* narrowly campanulate, with 6 oblong subacute hirsute lobes. *Petals* none. *Stamens* about 12, exserted. *Pistil* shorter than the stamens, ovary with long white hairs; style glabrescent. *Fruit* transversely oblong, glabrous, minutely pubescent, ·3 in. long and ·4 in. broad.

Perak; *Scortechini* 357.

9. Pygeum persimile, Kurz in Journ. As. Soc. Bengal Vol. XLI, 306. A tree; young branches slender, deciduously rusty-pubescent. *Leaves* thinly coriaceous, elliptic to elliptic-lanceolate, shortly and obtusely acuminate; the base rounded or slightly cuneate, eglandular; upper surface glabrous or glabrescent, very minutely punctate, dull, the midrib coarsely pubescent; lower surface brown, rugulose, with few scattered adpressed bristles, the nerves (but especially the midrib) strigose-pubescent; main nerves 7 or 8 pairs, spreading, very prominent (almost winged) on the lower surface; length 2·5–4 in., breadth 1·3–1·6 in.; petiole ·25–·3 in., slender, pubescent. *Racemes* usually in fascicles of 2 or 3 (sometimes united near the base), rarely solitary, from above the scars of fallen leaves, ·75–1·75 in. long, densely tawny-tomentose; bracts broadly ovate, acute or obtuse, longer than the pedicels. *Flowers* ·1 in. long and ·15 in. wide at the mouth, their pedicels less than ·1 in. *Calyx-tube* campanulate, tomentose outside, glabrous inside, the mouth with 6 distant obtuse teeth. *Petals* none. *Stamens* about 12 or 18, glabrous, spreading, exserted. *Pistil* erect, as long as the stamens, the ovary tawny-sericeous; the style glabrous above, sericeous below; stigma obliquely discoid. *Fruit* transversely oblong, with a deep vertical groove, scarcely apiculate, glabrous except for a few adpressed hairs in the groove, ·25 in. long and ·35 in. broad. Kurz For. Flora Burma, I, 436; Hook. fil. Fl. Br. Ind. II, 320.

Malacca; *Griffith.* Singapore; *Ridley* 4452.

Mr. Kurz inadvertently referred to this Griffith's No. 2056 from Tenasserim which he says is closely allied to *P. Lampongum*, Miq. In my own opinion Griffith's No. 2056 *is* P. *Lampongum*. Kurz's description of his *P. persimile* exactly agrees with Griffithian specimens from Malacca (without any number), and on some of these he has written the name *P. persimile* with his own hand. This species must therefore henceforth be considered as Malayan and not as Burmese.

10. Pygeum parviflorum, Teysm. & Binn. in Nat. Tijds. Ned. Ind. II, 309. A tree 50–70 feet high; young branches dark-coloured, minutely rusty-pubescent. *Leaves* coriaceous, elliptic to elliptic-oblong, shortly caudate-acuminate, the base cuneate, upper surface shining,

glabrous except sometimes the midrib pubescent; lower surface with sparse short adpressed hairs, the midrib and main nerves pubescent; main nerves 5 or 6 pairs, oblique, not curved, very prominent on the lower, faint on the upper surface; length 2·5–3·5 in., breadth 1·5–2 in., petiole ·3–·4 in. *Racemes* from ·85–1·5 in. long, solitary or several together from the axils of fallen leaves, tomentose; bracts broad, obtuse, tomentose, (subglabrous in VAR. *densa*). *Flowers* ·1 in. long, sub-sessile. *Calyx-tube* campanulate, with 6 obtuse short villous teeth. *Stamens* about 18, exserted, glabrous. *Pistil* as long as the stamens, ovary villous. *Style* sparsely pubescent especially towards the base; stigma capitate, discoid, grooved. *Fruit* slightly broader than long, compressed, sparsely adpressed-pubescent, subglabrous when old, ·25 in. long and ·3 in. broad. Miq. Flor. Ind. Bat. Vol. I, pt. I, 361; Hook. fil. Fl. Br. Ind. II, 320. *P. arboreum*, Endl. Gen. Pl. 1250, *in part*. *Polydontia arborea*, Blume Bijdr. 1105. *Polystorthia*, Blume Fl. Javae Praef. VIII, in part.

MALACCA; *Ridley* 1872. PENANG; *Curtis* 162. PERAK; *King's Collector* 7236, and 10827; *Curtis* 1293. DISTRIB. Java, Borneo.

VAR. *densa;* racemes not much longer than the petioles, the flowers much crowded and quite sessile, densely covered with pale tomentum; bracts very broad, subglabrous.

PERAK; *King's Collector* 6986, 10195, 10396, 10753.

It is possible that this variety ought to be treated as a species.

11. PYGEUM OVALIFOLIUM, King n. spec. A small tree 15–20 feet high; young branches with rather rough cinereous bark, deciduously rusty-pubescent. *Leaves* oval or broadly ovate; the apex obtuse, obliquely and minutely emarginate; the base rounded and eglandular; upper surface shining, minutely punctate and rugulose, the midrib convex and rusty-pubescent; lower surface dull, minutely pubescent, with adpressed bristles intermixed, the midrib tomentose; main nerves 7 or 8 pairs, spreading, slightly depressed on the upper and slightly prominent on the lower surface when dry; length 1·75–2·15 in., breadth 1–1·5 in., petiole ·3–·4 in. *Racemes* axillary, stout, from 3–5in. long, few-flowered, densely rusty-tomentose; bracts obliquely ovate, very concave, glabrous inside, densely tomentose outside. *Flowers* ·2 in. long, and ·3 in. wide at the mouth, sessile. *Calyx-tube* campanulate, densely tomentose outside, glabrous inside except at the base; the mouth with 10 oblong obtuse teeth. *Petals* none. *Stamens* about 30 or 40, glabrous, much exserted, spreading. *Pistil* shorter than the stamens; the ovary narrowly ovoid, sericeous; style stout, subglabrous; stigma obliquely discoid. *Fruit* subglobose with a slight vertical groove and shortly apiculate apex, sparsely strigose, ·35 in. in diam.

PERAK; at an elevation of about 5000 feet, *King's Collector* 7329.

12. Pygeum Hookerianum, King n. spec. A shrub or small tree; young branches dark-coloured, glabrous. *Leaves* thinly coriaceous, more or less broadly ovate, sometimes ovate-oblong, shortly acuminate, the base broad and rounded or sometimes slightly narrowed to the petiole; upper surface glabrous, the lower minutely rusty-pubescent especially on the midrib and nerves, the hairs partially deciduous; main nerves 6 or 7 pairs, spreading, slightly oblique, interarching rather far from the edge; length 2–4 in., breadth 1–1·8 in., petiole ·25 in. *Racemes* axillary and extra-axillary, sometimes crowded, usually less than ·5 in. long, densely rufous-tomentose. *Flowers* ·2 in. in diam., on very short pedicels each with a broadly ovate concave bracteole at its base. *Calyx-tube* tomentose outside, glabrous inside, widely campanulate, with 6 obtuse teeth. *Petals* 6, about as long as the calyx-teeth, lanceolate, pubescent externally. *Stamens* from the mouth of the calyx-tube, about 20, glabrous, much exserted. *Ovary* sericeous; style longer than the stamens, puberulous, stigma obliquely discoid. *Fruit* sub-globular, 1-seeded and ·25 in. in diam., or transversely elongate with a shallow vertical groove and often 2-seeded, ·25 in. long and ·4 in. broad, always glabrous and slightly apiculate, black or dark purple; seed when ripe covered with white down.

Perak; *Scortechini* 1234; *Wray* 3969; *King's Collector* 1970, 2083, 2753, 4789, 6425.

To this species I believe belongs No. 628 of the Maingay Herbarium referred to by Sir Joseph Hooker in a note on p. 322, Vol. II of the *Flora of British India*, but left undescribed by him for want of sufficiently good material.

13. Pygeum brevifolium, Hook. fil. Fl. Br. Ind. II, 321. A shrub 3 or 4 feet high; young branches dark-coloured, glabrous. *Leaves* coriaceous, broadly oblong, shortly and obtusely acuminate, sometimes minutely emarginate, both surfaces quite glabrous; the upper olivaceous brown, the lower brown; main nerves 4 or 5 pairs, spreading and interarching, faint beneath; length 2–2·5 in., breadth 1·1–1·3 in., petiole ·25–·3 in. *Racemes* axillary, only about ·3 in. long, sub-globose, tomentose, 6–10-flowered, bracts small. *Calyx-tube* urceolate, with 5 or 6 obtuse unequal teeth. *Petals* none. *Stamens* 10–16, filaments short. *Ovary* villous; style rather short, glabrous. *Fruit* unknown.

Malacca; Summit of Mount Ophir, *Griffith* 2051.

14. Pygeum Griffithii, Hook. fil. Fl. Br. Ind. II, 322. A tree? Young branches stout, densely tomentose. *Leaves* coriaceous, oblong or oblong-lanceolate, obtuse or obtusely cuspidate; the edges ciliate and obscurely sinuate-toothed; the base rounded or acute, with 2 small basal glands; both surfaces very minutely dotted; the upper glabrous, the midrib and main nerves impressed and puberulous; lower

surface minutely puberulous; main nerves 8–10 pairs, spreading, interarching; length 5 or 6 in.; petiole ·2 in., very stout. *Racemes* axillary, solitary, stout, ·5 in. long, few-flowered, densely tomentose. *Flowers* sessile. *Calyx-tube* obconic, with 6 oblong teeth. *Petals* none. *Stamens* 12. *Ovary* globose, hairy. *Fruit* unknown.

Malacca; *Griffith* 2050.

This species is very imperfectly known, the only specimens of it being Griffith's which are quite fragmentary. The above description is taken entirely from Sir Joseph Hooker, who in turn took the description of the flowers from Griffith's MSS. It may be distinguished by its sinuate-toothed leaves.

5. Rubus, Linn.

Sub-erect or sarmentose shrubs, always prickly. *Leaves* alternate, simple or compound; stipules free or adnate to the petiole. *Flowers* in terminal and axillary corymbose panicles, rarely solitary, white or red. *Calyx-tube* broad; lobes 5, persistent. *Petals* 5. *Stamens* many. *Disc* lining the calyx-tube. *Carpels* many, on a convex receptacle; style subterminal; ovules 2, collateral, pendulous. *Drupes* many, 1-seeded, crowded upon a dry or spongy conical or cylindric receptacle. *Seed* pendulous. Distrib. Abundant in the northern hemisphere, rare in the southern; species about 200.

Leaves simple:—	
Leaves palmately 5–7-lobed; terminal panicle shorter than the leaves; young branches tomentose, woolly or villous.	1. *R. moluccanus.*
Leaves ovate or ovate-triangular, with 2 or 4 shallow lobes at the base only; terminal panicle as long as the leaves; young branches with thin cobwebby pubescence.	2. *R. glomeratus.*
Leaves broadly ovate, not lobed; terminal panicle much longer than the leaves; young branches puberulous at first but speedily glabrous	3. *R. elongatus.*
Leaves pinnate	4. *R. rosæfolius.*

1. Rubus moluccanus, Linn. Spec. Pl. 707. A powerful subscandent shrub; the young branches, under surfaces of the leaves and inflorescence densely tawny or rusty-tomentose, villous or woolly; prickles short (·1 in. or less) and recurved on the branches, petioles and lower surfaces of the midribs, often absent on the main nerves. *Leaves* coriaceous, usually broader than long, broadly ovate or orbicular, deeply cordate; palmately 5–7-lobed, the lobes often lobulate; 2–10 in. in diam., the petioles 1–2·5 in. long; upper surfaces of leaves rugulose, sparsely hispid, the edges irregularly dentate or serrate. *Stipules* varying in size, oblong, toothed, pinnatifid or laciniate. *Panicles* axillary and terminal, much shorter than the leaves, few-flowered. *Flowers* from ·5–1 in. in diam., bracts like the stipules not with glandular hairs. *Calyx-*

lobes ·2–·4 in. long, more or less triangular, sometimes deeply toothed. *Petals* obovate, white, shorter than the calyx-lobes; ovaries numerous, glabrous. *Fruit* globose, succulent, the individual carpels red, the receptacle hairy. Roxb. Flor. Ind. II, 518; Miq. Flor. Ind. Bat. I, part 1, 382; Wall. Cat. 743; Kurz For. Flor. Brit. Burm. I, 437. *R. rugosus*, Smith in Rees Cyc. XXX, Rubus 34; Don Prodr. 234; Wight et Arn. Prodr. 299; Dalz. & Gibs. Bomb. Flor. 89; Thwaites' Enum. 101; Wight Ic. t. 225; Wall. Cat. 748. *Rubus Hamiltonianus*, Wall. Plant. As. Rar. III, 19, t. 234. *R. micropetalus*, *R. macrocarpus*, *and R. Fairholmianus*, Gardner in Calc. Journ. Nat. Hist. VIII, 6. *R. cordifolius*, Don Prodr. 233. *R. reflexus*, Ker in Bot. Reg. 461; Benth. Hong-Kong Flor. 104. *R. Hamiltonianus*, Seringe in DC. Prodr. II, 566. Rumph. Amboin. V, 88, t. 47, f. 2.

In all the Provinces except the Andaman and Nicobar Islands; common on the hilly parts. Distrib. British India, Malayan Archipelago.

Var. *alceæfolia*; pubescence very soft and velvety, leaves 4·5–10 in. in diam., prickles often ·2 or ·25 in. long, stipules and bracts pectinate, terminal panicle often 6 in. long, calyx-teeth spreading. *R. alceæfolius*, Poir. Encycl. VI, 247; Miq. Fl. Ind. Bat. Vol. I, Pt. 1, 379.

Perak; elevation 2000 feet, *Wray* 1463. Distrib. Malay Archipelago.

2. Rubus glomeratus, Blume Bijdr. 1111. A semi-scandent shrub; young branches slender, with pale deciduous cobwebby pubescence. *Leaves* thinly coriaceous, ovate or ovate-triangular, with 2–4 shallow lobes near the cordate base only, the upper half tapering to the acuminate apex, not lobed, the edges everywhere dentate; upper surface glabrous except the pale-pubescent midrib and sometimes the nerves, minutely rugulose; lower surface minutely rusty- or tawny-tomentose or sparsely pubescent, reticulate; length 3–4 in., breadth 1·75–2·5 in.; petiole 1–1·5 in. long, with minute prickles which extend sometimes to the midrib. *Stipules* ovate, pinnatifid, deciduous. *Panicles* axillary and shorter than the leaves, or terminal and as long as the leaves, few-flowered, tawny-tomentose. *Flowers* ·35 in. in diam. *Calyx-lobes* triangular, entire, acute, tomentose. *Petals* as long as the calyx-lobes, obovate. *Carpels* of the fruit numerous, red. *R. Hasskarlii*, Miq. Flor. Ind. Bat. Vol. I, Pt. 1, 381. *R. acerifolius*, Wall. Cat. 744.

Penang; Singapore; Perak. Distrib. Malay Archipelago.

Var. *gracilis*, King; terminal panicles twice as long as the leaves; pedicels of the flowers ·4–·6 in. long.

In its long terminal panicles this variety resembles *R. elongatus*, but the flowers have longer pedicels; moreover the venation of the leaves is quite that of *R. glomeratus*.

3. Rubus elongatus, Smith Icon. Ined. III, t. 62. A scandent

shrub; young branches at first pubescent but speedily glabrous, the bark dark-coloured and with minute deflexed prickles. *Leaves* coriaceous, broadly ovate, deeply cordate at the base, the apex acute; the edges sinuate and remotely dentate, not lobed; upper surface smooth, glabrous except the pubescent midrib; under surface pale, and (except 3 or 4 on the midrib) without prickles; the nerves and veins glabrous and chestnut-brown, the areolæ minutely pale-tomentose; length 3·5–5·5 in., breadth 2·5–3·5 in., petiole 1·35–2 in., with a few small prickles. *Stipules* ovate, pinnatifid, deciduous. *Panicles* pubescent and with small scattered prickles, a few axillary and shorter than or as long as the leaves; the terminal one much longer than the leaves (often 15 in. long) with distant branches; the flowers mostly clustered at their extremities, subsessile or shortly pedicelled, ·3 in. in diam. *Calyx-lobes* triangular, blunt, tawny-tomentose. *Fruit* with numerous red carpels. DC. Prodr. II, 567; Blume Bijdr. 1112. *R. Lobbianus*, Hook. Ic. Pl. t. 741–742.

Perak; *Wray* 421, 1849; *King's Collector* 3465, 5732; *Scortechini* 1468. Distrib. Sumatra.

4. Rubus rosaefolius, Smith Ic. Ined. III, t. 60. A subscandent woody shrub; branches, petioles leaf-rachises and inflorescence with long stiff usually glandular hairs, with shorter softer hairs intermixed and a few sharp polished hooked spines. *Leaves* pinnate, 2–5 in. long; leaflets 3–7, membranous, lanceolate or ovate-lanceolate, unequally incised-serrate, rarely with 1 or 2 basal lobes, the apex acuminate, the base rounded; upper surface sparsely strigose, the midrib and nerves villous; lower surface less strigose than the upper, minutely reticulate, never white or glaucous; length of leaflets 1–3 in., breadth ·35–1·2 in.; petiolules of the lateral leaflets ·1–·2 in., those of the terminal ones ·5–1 in. *Stipules* linear-lanceolate, acuminate. *Flowers* ·75–1 in. in diam., on pedicels much longer than themselves, solitary or in lax few-flowered panicles. *Calyx-lobes* lanceolate, acuminate, not prickly, woolly or glabrous. *Petals* usually larger than the calyx-lobes, broadly obovate, white. *Fruit* elongated, rarely subglobose, the numerous red carpels on a glabrous receptacle. Roxb. Flor. Ind. II, 518; Wall. Cat. 728; Kurz For. Flora Brit. Burm. I, 439; Hook. Ic. Pl. t. 349; Hook. fil. Fl. Br. Ind. II, 341. *R. pinnatus*, Willd. *R. asper*, Don Prodr. 234; Wall. Cat. 741.

Perak; at 3900 feet. *Wray*, at 4500 feet, No. 4187. Distrib. British India, Java.

6. Pyrus, Linn.

Trees or shrubs. *Leaves* deciduous, simple or pinnate; stipules deciduous. *Flowers* white red or pink, in terminal cymes or corymbs; bracts subulate or linear. *Calyx-tube* urceolate turbinate or obconic,

lobes 5, erect or reflexed, persistent or deciduous. *Petals* 5, quincuncially imbricate in bud. *Stamens* 20 or more, filaments sometimes connate at the base. *Disc* annular, or lining the calyx-tube. *Carpels* 2–5, connate and adnate to the calyx-tube; styles 2–5, free or connate below, stigmas truncate; ovules 2 in each cell, basal, collateral, ascending. *Fruit* (a pome) fleshy, 2–5-celled; cells with a membranous or cartilaginous often 2-valved endocarp, 1–2-seeded. *Seeds* when in pairs plano-convex, testa coriaceous; cotyledons amygdaloid. Distrib. N. temp. and cold regions; species about 100.

Pyrus granulosa, Bertol. in Mem. Acad. Sc. Bolog. Ser. II, IV, 312. A small glabrous tree. *Leaves* coriaceous, ovate, usually acuminate, the base cuneate or rounded, the edges serrate or sinuate-serrate; upper surface shining, the lower dull-brown when dry; main nerves 7–9 pairs, prominent on the lower surface, oblique. *Fruits* globose-pyriform, minutely rugulose, glabrous, the calyx-lobes not persistent, ·75 in. long and ·6 in. in diam., 4-celled, in lax terminal glabrous corymbs longer than the leaves; fruit pedicels from ·4–1·5 in. long, endocarp of large granules. Hook. fil. Fl. Br. Ind. II, 378. *P. sikkimensis*, Wenzig in Linnæa, 1874, 58, *in part*; Kurz For. Flor. Brit. Burm. I, 442. *P. Karensium*, Kurz in Journ. As. Soc. Beng. 1872, II, 306; 1873, II, 232.

Perak; at an elevation of 2000–2500 feet; *Scortechini*. Distrib. Burma; Khasia Mountains; Sumatra, *Forbes* 2050! 2376.

Order XL. SAXIFRAGACEÆ.

Trees shrubs or herbs. *Leaves* alternate and exstipulate, or stipules adnate to the base of the petiole, or opposite and exstipulate. *Inflorescence* various; flowers hermaphrodite or polygamo-dicœcious; the sepals, petals and stamens symmetrically regular. *Calyx* more or less adnate to the ovary, sometimes nearly free, sometimes quite inferior; lobes imbricate or valvate. *Petals* 5 or 4, rarely 0, perigynous or epigynous, rarely sub-hypogynous, imbricate or valvate. *Stamens* inserted with the petals, equalling or double their number, rarely numerous. *Ovary* of 2 or 3–5 united carpels; usually 2- or 3–5-celled with axile placentas, occasionally 1-celled with parietal placentas; styles as many as the carpels, distinct or combined nearly to the summits, stigmas capitate or lateral and subcapitate; ovules numerous, anatropous, erect or pendulous. *Fruit* capsular or berried. *Seeds* numerous or several (solitary in *Polyosma*) albuminous; the albumen rarely scanty or nearly wanting. Distrib. Species 580; in the cold or temperate regions of the whole world and in the mountains of the tropics; together with a few genera of tropical trees.

A sub-herbaceous shrub, with simple exstipulate leaves, and succulent fruits with numerous small seeds ... ... 1. DICHROA.
Woody shrubs or trees with pinnate (rarely simple) stipulate leaves; fruits small, dry, capsular, dehiscent, 2-celled; seeds few hairy ... ... 2. WEINMANNIA.
Trees or large woody shrubs with simple leaves, 4-merous flowers, and dry fruit with a single large smooth seed ... 3. POLYOSMA.

1. DICHROA, Lour.

A sub-herbaceous shrub. *Leaves* opposite, more or less serrate, lanceolate, persitent, exstipulate. *Panicle* terminal. *Calyx-tube* adnate to the ovary; limb 5–6-toothed. *Petals* 5 or 6, thick, valvate, blue or purplish. *Stamens* 10 or 12, epigynous. *Ovary* $\frac{3}{4}$-inferior, 1-celled; styles 3–5; ovules numerous, on 3–5 parietal placentas formed by the inflexed margins of the carpels. *Berry* $\frac{3}{4}$-inferior, blue. *Seeds* numerous, small, obovoid; testa with large reticulations.

DICHROA FEBRIFUGA, Lour. Fl. Cochinch, 301. A shrub 3–6 feet high; branches terete, nearly glabrous. *Leaves* membranous, caudate-acuminate, the base cuneate, the edges more or less distinctly serrate in the upper three-fourths, entire in the lower fourth; main nerves 8 or 9 pairs, ascending; length 4–5 in., breadth 1·4–1·8 in.; petioles unequal, from ·6–1·75 in. *Panicles* adpressed-pubescent. Hook. fil. Fl. Br. Ind. II, 406; Benth. Fl. Hongk. 128; Maxim. in Mem. Acad. Petersb. X 16, p. 2. *D. cyanitis* and *D. latifolia*, Miq. Fl. Ind. Bat. I, 721, 722. *Adamia versicolor*, Fortune in Journ. Hort. Soc. I, 298; Lindl. & Paxt. Fl. Gard. I, t. 5. *A. cyanea*, Wall. Cat. 441; Tent. Fl. Nep. t. 36; Pl. As. Rar. t. 213; Bot. Mag. t. 3046; DC. Prodr. IV, 16; H. f. & T. in Journ. Linn. Soc. II, 76. *A. chinensis*, Gardn. & Champ. in Kew Journ. Bot. I, 311. *Cyanitis sylvatica*, Reinw. in Blume Bijd. 921; DC. Prodr. IV, 16.

PERAK; on the Central Range; *Scortechini* 266. DISTRIB. On the higher parts of the Malayan Archipelago; China; Philippines; Temperate Himalaya from Bhotan to Nepal; Khasia Mountains.

2. WEINMANNIA, Linn.

Trees or shrubs, usually with terete opposite branches. *Leaves* stipulate, opposite, coriaceous, unequally pinnate, 3-foliolate or simple, leaflets usually glandular-serrate. *Flowers* hermaphrodite or polygamo-dioecious. *Calyx-tube* short, the lobes 4 or 5, imbricate, persistent or deciduous. *Petals* 4 or 5, sessile, imbricate, spathulate or obovate, inserted under the lobed margin of the perigynous disc. *Stamens* 8 or 10, inserted with the petals, the filaments often elongated and exserted; the anthers small, 2-celled. *Ovary* free, ovoid or conical, 2-celled, 2-beaked;

styles 2, subulate, persistent, the stigmas simple. *Capsule* small, coriaceous, 2-celled, septicidally 2-valved, the valves boat-shaped, few- or many-seeded. *Seeds* oblong, reniform or subglobose; the testa membranous, often hairy. *Embryo* terete, in the axis, or towards the apex, of the fleshy albumen. Distrib. Species about 80; Malayan, Mascarene, Australasian, and American.

Weinmannia Blumei, Planch. in Hook. Lond. Journ. Bot. Vol. 6, (1847), p. 470. A small tree; young branches with sparse black stiff hairs and many lenticels. *Stipules* obovate-rotund, adpressed-pubescent, ·2 in. in diam. *Leaves* 2–3·5 in. long, pinnate; leaflets 9–11, opposite, sessile, narrowly oblong-lanceolate with acute apices and slightly narrowed and oblique bases, their edges remotely glandular-serrate, the upper surfaces glabrous, the lower glabrous but for a very few scattered black hairs; main nerves 6 or 7 pairs, dark-coloured; length ·75–1 in., the terminal one longer, breadth ·2–·3 in. *Racemes* clustered at the apices of the branches, about as long as the leaves, puberulous, many-flowered. *Flowers* less than 1 in. long, their pedicels shorter. *Capsules* narrowly elliptic, glaberulous, crowned by the 2 divergent styles. *Seeds* elongated, very comose at one end, less so at the other. Miq. Fl. Ind. Bat. Vol. I, pt. 1, 718. *Spiræa pinnata*, Blume, Cat. Hort. Bot. Bogor. *Arnoldia pinnata*, Blume Bijdr., 868.

Malacca; on Mount Ophir, *Griffith*. Perak; on Gunong Bubu, at an elevation of 5000 feet, *Wray* 3814; on Gunong Idjan at 5000 feet, *Scortechini* 446.

3. Polyosma, Blume.

Evergreen trees or shrubs. *Leaves* opposite or subopposite, petioled, acute or acuminate. *Flowers* in terminal racemes (in some non-Indian species solitary) 3-bracteolate. *Calyx-tube* entirely adnate to the ovary; lobes 4, small, persistent. *Petals* 4, epigynous, linear, valvate, white, yellowish or greenish, much recurved when expanded, fugacious, usually hairy within. *Stamens* 4, epigynous, filaments hairy. *Ovary* inferior, 1-celled; style columnar, stigma simple; ovules numerous, ascending, on two parietal placentas which project considerably into the cavity of the ovary. *Fruit* sub-baccate, 1-seeded. *Seed* ascending, subbasal. Distrib. Species 18; Malayan, British Indian and tropical Australasian.

Leaves quite glabrous on both surfaces :—
  Leaves sharply sinuate-dentate, membranous; flowers ·2 in. long ... ... 1. *P. parviflora.*
  Leaves quite entire, coriaceous, flowers ·3 or ·35 in. long :—
    Leaves elliptic to elliptic-rotund, or obovate; calyx strigose ... ... 2. *P. coriacea.*

Leaves oblong or oblong-lanceolate, calyx nearly glabrous	3. *P. Scortechinii.*
Leaves glabrous on the upper surface, the midrib and nerves, often with the intervening spaces on the lower surface also adpressed-pubescent :—	
Fruit truncate at the base and with 4 deep vertical grooves; flowers not more than ·3 in. long; leaves entire ...	4. *P. mutabilis.*
Fruit not truncate at the base and not vertically ridged :—	
Fruit subglobular; flowers ·35 in. long; leaves entire ...	5. *P. fragrans.*
Fruit ovoid, tapering at the base; flowers ·45 in. long; leaves entire or remotely serrate	6. *P. integrifolia.*
Leaves glabrous on the upper surface, the lower surface always in the young leaves, and usually in adult leaves covered with dense yellowish tomentum :—	
Fruit sub-globular, not ridged, ·25 in. long	7. *P. læte-virens.*
Fruit ovoid with a truncate base, and with 4 deep vertical ridges, ·4 in. long	8. *P. velutina.*
Imperfectly known species near *P. velutina*, Bl.	9. *P. Ridleyi.*

1. Polyosma parviflora, King n. spec. A small tree; young branches slender, glabrous. *Leaves* membranous, narrowly elliptic, shortly caudate-acuminate, the edges sinuate-dentate in the upper three-fourths, entire in the lower fourth, the base cuneate; both surfaces glabrous, dull and dark-coloured when dry, the lower slightly paler than the upper; main nerves 10–12 pairs, sub-horizontal, slightly prominent on the lower surface only; length 2·5–3·25 in., breadth 1–1·5 in.; petiole ·3–·5 in., sparsely pubescent, channelled. *Racemes* terminal, shorter than the leaves, puberulous. *Flowers* ·2 in. long, their pedicels ·05 in., adpressed-pubescent; the bracteoles linear, longer than the pedicel. *Calyx-tube* narrow, nearly glabrous, the mouth with triangular acuminate teeth. *Petals* only twice as long as the calyx, linear, obtuse, pubescent externally, longer than the anthers. *Fruit* flask-shaped, the apex crowned by the calyx-teeth and the pointed base of the style, the base rounded and slightly gibbous, glabrous, ·5 in. long, and ·3 in. in diam.

Perak; on Gunong Inas, at 5000 feet, *Wray* 4143.

A species somewhat resembling *P. ilicifolia*, Blume in the shape of its leaves; but having much shorter racemes and smaller flowers, and an almost glabrous calyx.

2. Polyosma coriacea, King n. spec. A shrub or small tree; young branches glabrous, sparsely lenticellate. *Leaves* coriaceous, elliptic to elliptic-rotund, rarely sub-obovate, the apex acute or shortly acuminate, the edges entire and slightly revolute when dry, the base cuneate; both surfaces glabrous, the upper shining, the lower dull and paler; main nerves 9–11 pairs, spreading, interarching freely, slightly prominent on the lower surface only; length 2·75–4 in., breadth 1·5–2 in., petiole about ·75 in. *Racemes* terminal, about as long as or longer than

the leaves, sparsely adpressed-pubescent. *Flowers* ·35 in. long; their pedicels ·1 in., bearing 3 unequal linear-acuminate strigose bracteoles. *Calyx-tube* shorter than the pedicel, slightly constricted under the mouth; the teeth triangular, acute, strigose like the tube. *Petals* much longer than the calyx and slightly longer than the stamens, linear, obtuse, minutely strigose outside, sub-villous inside. *Fruit* (very young) ovoid, glabrous, crowned by the calyx-teeth.

Perak; on Gunong Bubu at an elevation of 5000 feet; *Scortechini* 805; *Wray* 3819, 3855, 4131. Ridley's 5219 from Kedah Peak possibly belongs to this species. Its leaves, however, are thinner, and their nerves more distinct.

3. Polyosma Scortechinii, King n. spec. A medium-sized tree (*fide* Scortechini); young branches slender, with pale almost polished bark, all parts except the inflorescence glabrous. *Leaves* coriaceous, oblong or oblong-lanceolate, sometimes oblanceolate, acute, much narrowed to the base; the edges entire, slightly revolute when dry; both surfaces shining, glabrous, except sometimes a few hairs on the midrib beneath; main nerves 10–12 pairs, spreading, interarching, faint on both surfaces; length 4–6·5 in., breadth 1·5–2 in., petiole ·35–·6 in. winged. *Racemes* terminal, shorter than the leaves, sparsely puberulous. *Flowers* ·3 in. long, their pedicels about ·05 in.; the bracteoles small, lanceolate, hairy. *Calyx-tube* nearly glabrous; its lobes shallow, triangular. *Petals* linear, subacute, pubescent outside, only slightly so inside, about as long as the almost glabrous stamens. *Fruit* unknown. *P. integrifolia*, Herb. Scortechini (not of Blume).

Perak; *Scortechini* 1900.

Readily distinguished by its perfectly glabrous leaves and nearly glabrous flowers.

4. Polyosma mutabilis, Blume, Mus. Bot. Lugd. Bat. I, 261. A tree 20-40 feet high; young branches lenticellate, deciduously rusty-pubescent. *Leaves* narrowly elliptic, tapering gradually from about the middle to each end, not caudate-acuminate, the edges quite entire; upper surface black when dry, glabrous, shining; the lower deep-olivaceous, very sparsely pubescent, the midrib and nerves adpressed-pubescent; main nerves 8–10 pairs, spreading, slightly prominent on the lower and slightly depressed on the upper surface, length 3·5–6 in., breadth 1·25–1·75 in.; petiole ·5–1·1 in., slender. *Racemes* terminal, much longer than the leaves, with short rather sparse pubescence. *Flowers* ·3 in. long, their pedicels about ·05 in. long with 2 adpressed bracteoles. *Calyx-tube* about as long as the pedicel, pubescent; its lobes short, triangular. *Petals* many times longer than the calyx, linear, sub-obtuse, pubescent, slightly longer than the stamens. *Fruit* ovoid from a

broad truncate base, the apex pointed and crowned by the small persistent calyx-teeth; length ·45 in.; breadth at the base ·25 in.; puberulous, black when ripe, the pedicel ·25–·3 in. long, pubescent. Miq. Flor. Ind. Bat. Vol. I, pt. 1, 724; Suppl. 336.

Perak; *King's Collector* 2596, 4344, 8332; *Wray* 925. Johore; *Lake and Kelsall* 4057. Malacca; *Goodenough* 438.

This species is closely allied to *P. integrifolia*, Blume; but has flowers only ·3 in. long on pedicels only ·05 in. long, while the flowers of *P. integrifolia* measure ·45 in. and its pedicels ·1 in. The best distinction between the two species lies however in the fruit which is in this truncate at the base and vertically ridged, while in *P. integrifolia* the fruit has a tapering base and is not ridged.

5. Polyosma fragrans, Benn. Pl. Jav. Rar. 196. A shrub 5 or 6 feet high; young branches slender, deciduously pubescent. *Leaves* elliptic, tapering much to each end, the apex abruptly acuminate; the base cuneate, the edges entire; the upper surface quite glabrous; the lower sparsely adpressed-pubescent especially on the midrib and 7–10 pairs of subhorizontal faint main-nerves; length 2·5–3 in., breadth 1·1–1·35 in.; petiole ·4 in., slender, pubescent. *Raceme* terminal, erect, rather longer than the leaves, tawny-pubescent. *Flowers* ·35 in. long, rather crowded, their pedicels under ·1 in. long with 2 adpressed bracteoles. *Calyx-tube* short, sericeous; the mouth with 4 small triangular teeth. *Petals* many times longer than the calyx, linear, acute, adpressed-pubescent. *Stamens* shorter than the petals. *Anthers* linear, elongate; filaments broad, sparsely villous on the inner side. *Fruit* sub-globular, apiculate, glabrous, ·2 in. in diam. H. f. & T. in Journ. Linn. Soc. II, 77; Miq. Fl. Ind. Bat. 1, pt. I, 724; Suppl. I, 336; Clarke in Hook. fil. Flor. Br. Ind. II, 408. *Itea fragrans*, Wall. in Roxb. Flor. Ind. II, 420; Wall. Cat. 8472, *partly*.

Perak; *Scortechini* 520. Singapore; *Wallich*. Distrib. Sumatra.

6. Polyosma integrifolia, Blume Bijdr. 659. A tree 20–40 feet high; young branches lenticellate, deciduously rusty-pubescent. *Leaves* oblanceolate, the apex shortly and abruptly caudate-acuminate, gradually narrowed from the middle or above it to the petiole, the edges entire or remotely serrate, drying of a rather dark-brown colour; upper surface glabrous or with a few hairs on the midrib; the lower paler, with adpressed hairs on the midrib and sometimes also on the nerves; main nerves 8–12 pairs, spreading, interarching, slightly prominent on the lower surface only; length 3·5–8 in., breadth 1·35–3 in.; petiole ·5–1 in., rather stout, pubescent. *Racemes* terminal, often longer than the leaves, subadpressed-sericeous. *Flowers* ·45 in. long, rather crowded; their pedicels ·1 in. long, pubescent, with 2 linear-lanceolate bracts. *Calyx-tube* about as long as the pedicel, pubescent; the mouth with 4

spreading triangular teeth. *Petals* linear, subacute, longer than the stamens and much longer than the calyx, slightly pubescent; anthers elongate, filaments slightly pubescent. *Fruit* ovoid, tapering to each end, the apex crowned by the persistent calyx-teeth and base of the style, puberulous, black when dry, ·4 in. long and ·25 in. in diam.; the pedicel ·15 in. long, puberulous. Benn. Pl. Jav. Rar. p. 196; DC. Prodr. IV, 276; Blume Mus. Bot. I, 260; H. f. & T. in Journ. Linn. Soc. II, 77; Miq. Fl. Ind. Bat. I, pt. I, 724; Suppl. I, 335. Clarke in Hook fil. Fl. Br. Ind. II, 409. *Itea fragrans*, Wall. Cat. 8472, *partly*.

Var. 1. *typica;* leaves entire.

Malacca; *Griffith* 2510 (Kew Distrib.); *Maingay* 632. Perak; *Wray* 508; *King's Collector* 3802. Penang; *Curtis* 1081. Andaman Islands; *King's Collectors*, *Prain*.

Var. 2. *Wallichii*, Clarke in Hook fil. Fl. Br. Ind. II, 409; leaves remotely serrate. *P. Wallichii*, Benn. Pl. Jav. Rar. p. 196; Wall Cat. 8471; H. f. & T. in Journ. Linn. Soc. II, 77; Kurz For. Flora Burma, I, 444.

Andaman Islands. Distrib. Khasia Hills, Assam.

As I have noted under *P. mutabilis*, Bl., the only tangible distinction between that plant and this is that the former has fruit truncate at the base and with 4 bold vertical grooves, while this has smooth fruit. Many of the specimens above-quoted as belonging to this are not in fruit, and I accept them as *P. integrifolia* in deference to the authority of the Flora of British India.

7. Polyosma læte-virens, Griff. MSS. in Herb. Kew. A tree 20–50 feet high; young branches yellowish-tomentose. *Leaves* drying of a yellowish-green, coriaceous, oblanceolate or narrowly-elliptic, shortly acuminate, much narrowed to the base; the edges entire, slightly revolute when dry; upper surface glabrous, shining, the midrib minutely tomentose, lower surface yellowish-tomentose; main nerves 8 or 9 pairs, spreading, interarching, prominent on the lower surface only; length 3·25–5·5 in., breadth ·8–2·25 in., petiole ·35–·5 in. *Raceme* solitary, terminal, tomentose, rather longer than the leaves. *Flowers* ·3 in. long, on pedicels ·1 in. long. *Calyx-tube* slightly longer than the three narrowly oblong adpressed bracteoles, its mouth with 4 broad triangular obtuse teeth, yellowish-tomentose. *Petals* much longer than the calyx and slightly longer than the stamens, linear, tapering to the obtuse apex, villous in front, tomentose behind. *Filaments* nearly as long as the anthers, villous in front. *Fruit* ovoid or globular-ovoid, crowned by the calyx-teeth, deciduously adpressed-sericeous and lepidote, ·25 in. long, the pedicel ·1–·2 in. *P. mutabilis*, Clarke in Hook. fil. Fl. Br. Ind. II, 469 (not of Blume).

Malacca; *Griffith* 2508, 2509; *Maingay* 633. Perak; *King's Collector* 8775. Penang; *Curtis* 377, 758.

Griffith's original specimens, to which he gave the MSS. name *P. læte-virens*, have smaller leaves and more ovoid fruit on shorter pedicels than any specimens subsequently collected. But in other respects they agree with specimens more recently collected in Perak and Penang.

8. Polyosma velutina, Blume Mus. Bot. Lugd. Bat. I, 261. A small tree; young branches stout, deciduously tomentose. *Leaves* coriaceous, elliptic to elliptic-oblong, sometimes slightly obovate, sub-acute or obtuse, the base cuneate; the edges entire, revolute when dry; upper surface at first with a few scattered adpressed hairs, glabrous when old except the pubescent depressed midrib and main nerves; lower surface covered with soft velvety yellowish tomentum; main nerves 9–12 pairs, prominent on the lower surface only; length 4–7·5 in., breadth 1·75–3·25 in., petiole ·6–1·5 in. *Raceme* terminal, about one and a half times as long as the leaves, stout, densely yellowish-tomentose like the calyx. *Flowers* ·4 in. long, their pedicels rather over ·1 in., with 3 narrow unequal adpressed bracteoles. *Calyx-tube* tomentose; its teeth triangular, acute. *Petals* narrowly linear, sub-acute, slightly longer than the stamens, much longer than the calyx; the filaments slightly villous in front, about equal to the anthers. *Fruit* ovoid, with a broad sub-truncate base, and with an apiculus formed by the remains of the base of the style, boldly 4-ridged, sparsely and deciduously strigose, ·4 in. long and ·3 in. in diam. at the base; the pedicel ·2 in.; endocarp woody, deeply 4-grooved.

Penang; *Curtis* 1165; *King's Collector* 1352. Perak; *Scortechini* 2111; *King's Collector* 3685, 4362. Distrib. Sumatra, Java.

I identify the Penang and Perak plants with Blume's *P. velutina* by description only; for I have seen no authentic specimen of that species. The deep vertical ridging of the endocarp is noted of no other described species except *P. mutabilis*, Bl., and I think my identification is correct.

9. Polyosma Ridleyi, King n. spec. A tree; young branches densely and minutely tomentose. *Leaves* coriaceous, narrowly-elliptic, caudate-acuminate, the edges entire and slightly revolute when dry, the base cuneate; upper surface when young sparsely adpressed-pubescent, when adult glabrous and shining; lower surface covered with dense yellowish tomentum; main nerves 9–11 pairs, spreading, curving and interarching, rather prominent on the lower surface, the intermediate nerves almost as prominent; length 6–6·5 in., breadth 2–2·5 in.; petiole 1–1·75 or even 2 in., tomentose. *Raceme* terminal, stout, shorter than the leaves, densely covered with pale yellowish or whitish tomentum like the calyx and petals. *Flowers* ·4 in. long, their pedicels ·1 in., with 3 equal lanceolate bracteoles on the same level. *Calyx-tube* shorter than the pedicel, wide; the teeth broad, shallow. *Petals* much longer than the calyx, linear, blunt, villous in front. *Stamens* nearly as long

as the petals; the filaments flat, villous in front, scarcely so long as the anthers. *Style* subglabrous. *Fruit* unknown.

SINGAPORE; *Ridley* 3972.

A very distinct species in the neighbourhood of *P. velutina*, Bl., but with narrower leaves, much more tomentose flowers and inflorescence, and a wider calyx-tube.

NOTE.—I here take the opportunity of describing a very distinct new species from Sumatra.

POLYOSMA LONGE-PEDICELLATA, King n. spec. A shrub or tree 15 feet high; young branches coarsely adpressed-pubescent. *Leaves* elliptic or obovate-elliptic, abruptly and shortly acuminate; the edges slightly sinuate and very obscurely and minutely toothed, slightly recurved when dry; the base cuneate; upper surface glabrous, finely reticulate; the lower with short coarse adpressed hairs especially on the midrib, finely reticulate; main nerves 14–16 pairs, almost horizontal, slightly curved and interarching towards the edge of the bade, slightly prominent on the lower surface only when dry, the intermediate nerves almost as distinct; the reticulations minute, distinct on both surfaces; length 5·25–7 in., breadth 2·2–3·25 in.; petiole ·75–1·25 in., puberulous. *Raceme* solitary, terminal, rather longer than the leaves, with pubescence like the young branches. *Flowers* ·5 in. long, on slender adpressed-pubescent pedicels ·3–·35 in. long, and bearing three adpressed bracteoles towards their apices. *Calyx-tube* ·1 in. long, adpressed-pubescent, its teeth broadly triangular. *Petals* ·4 in. long, linear, obtuse, adpressed-pubescent outside. *Fruit* ovoid, tapering to each end, crowned at the apex by the very short calyx-lobes and by the sharp base of the style, minutely adpressed-pubescent, ·5 in. long, and ·3 in. in diam. *Fruit* pedicels ·5–·7 in. long, sometimes deflexed.

EASTERN SUMATRA; at elevations of 3200 and 3700 feet, *Forbes* 2037, 2250.

ORDER XLI. DROSERACEÆ.

Herbs; catching insects by means of glandular viscid hairs, or by means of petioled leaves with automatically closing laminæ. *Flowers* hermaphrodite, regular. *Calyx* 4–5- (rarely 8-) partite; or sepals free, imbricate, persistent. *Petals* and *stamens* as many as the sepals, hypogynous or nearly so. *Ovary* nearly free, globose or ovoid, 1–3-celled; styles 5–3, capitate, fimbriate or bifid; ovules numerous, on parietal placentas equal in number to the styles. *Capsule* membranous, 5–3-valved, many-seeded. *Seeds* with fleshy albumen; embryo cylindric or minute. DISTRIB. Species 110; spread over nearly all temperate and tropical lands except the islands of the Pacific.

1. DROSERA, Linn.

Perennial herbs, scapigerous or with a leafy stem, glandular-pilose. *Leaves* radical or alternate, usually circinate in vernation; stipules 0, or scariose and adnate to the petiole. *Calyx* free from the ovary, 4–8-partite, sepals persistent. *Petals* 4–8, hypogynous or scarcely perigynous, white or rose-coloured, withering, persistent. *Stamens* as many

as the petals, hypogynous or scarcely perigynous. *Ovary* 1-celled with 2–5 styles; ovules parietal, numerous. *Capsule* loculicidally 2–5-valved. *Seeds* numerous; in the Indian species obovoid-ellipsoid, with the testa black, smooth, reticulate, not lax. Distrib. Species 100; scattered throughout the world except Polynesia; very numerous in Australia.

Leaves cauline, linear ...	...	...	...	1. *D. indica.*
Leaves all radical, spathulate-cuneate		...	...	2. *D. Burmanni.*

1. Drosera indica, Linn. Sp. Pl. 282. *Stems* suberect, from 1–6 in. high. *Leaves* cauline, alternate, linear, elongate, very glandular-pubescent, hardly broader than the glabrous petiole; the stipules much shorter than the petioles. *Racemes* leaf-opposed; flower-pedicels ·25 in. or more in length, glandular-hairy. *Styles* 3, bifid to near the base. DC. Prodr. I, 319; Roxb. Fl. Ind. II, 313; Wall. Cat. 1244; Wight Ill. t. 20; W. & A. Prodr. 34; Planch. in Ann. Sc. Nat. Ser. III, Vol. IX, 204; Miq. Fl. Ind. Bat. I, Pt. II, p. 120; H. f. & T. in Journ. Linn. Soc. II, 82; Thwaites Enum. 21; Dalz. & Gibs. Bomb. Fl. 12; Kurz in Journ. As. Soc. 1876, Pt. II, 310; Clarke in Hook. fil. Fl. Br. Ind. II, 424. *D. Finlaysoniana*, Wall. Cat. 3752. *D. serpens*, Planch. l. c. 204. *D. hexagyna*, Blanco Fl. Filip. 139; Rheede Hort. Mal. X, t. 20.

In swampy places in all the Provinces, except the Andaman and Nicobar Islands. Distrib. The southern part of British India, Ceylon, Burma, the Malayan Archipelago, China, tropical Australia, Africa.

2. Drosera Burmanni, Vahl Symb. III, 50. *Stem* very short; the leaves all radical, spathulate-cuneate, glandular-pubescent; the stipules nearly as long as the petioles. *Scapes* 1–3, two to eight inches high, the raceme occupying the upper fourth only, glabrescent. *Flower-pedicels* less than ·25 in. long, glabrous. *Styles* 5, not bifid. Don Prodr. 212; DC. Prodr. I, 318; Roxb. Fl. Ind. II, 113; Wall. Cat. 1242; Wight. Ill. t. 20; Wight Ic. t. 944; W. & A. Prodr. 34; Planch. in Ann. Sc. Nat. Ser. III, Vol. IX, 190; Miq. Fl. Ind. Bat. I, Pt. II, p. 120; H. f. & T. in Journ. Linn. Soc. II, 82; Clarke in Hook. fil. Fl. Br. Ind. II, 424; Thwaites Enum. 21; Dalz. & Gibs. Bomb. Fl. 12; Kurz in Journ. As. Soc. 1876, Pt. II, 310.

In swampy places in all the Provinces, except the Andaman and Nicobar Islands. Distrib. Plains of British India, Ceylon, the lower Himalaya, Malayan Archipelago, China, Japan, Australia, West Africa.

Order XLII. HAMAMELIDEÆ.

Trees or shrubs. *Leaves* alternate, petiolate, simple or palmately lobed; stipules 1–2, rarely wanting, deciduous or rarely persistent. *Flowers* hermaphrodite or unisexual, collected into heads or spikes. *Calyx* small or 0, adnate to the ovary. *Petals* 0 or 4–5, perigynous or

nearly epigynous. *Stamens* 4–∞, perigynous, or rarely hypogynous; anthers dehiscing longitudinally. *Ovary* 2-celled; styles 2, separate and ultimately divaricate, usually persistent; ovules 1–∞, axile, pendulous. *Capsule* woody, its segments often bifid; endocarp often horny and separating from the exocarp. *Seeds* 1, or many and then usually only the lowest in each cell perfect. DISTRIB. Species 35; Eastern Asia, the Himalaya, Khasia Hills, Malaya, China and Japan; also in North America and in South Africa.

Ovules solitary in each cell :—	
Stipules small and deciduous; heads ebracteate; stamens 5, with short filaments, the connective produced into a horn; flowers hermaphrodite	1. MAINGAYA.
Ovules 6 or more in each cell :—	
Stipules large, coriaceous; heads ebracteate; stamens 10–14, without appendages; flowers polygamous	2. BUCKLANDIA.
Stipules absent; heads with numerous coloured bracts; stamens 7–10 without appendages; flowers hermaphrodite...	3. RHODOLEIA.

1. MAINGAYA, Oliver.

A tree. *Leaves* alternate, undivided, petioled, persistent; stipules small, deciduous. *Heads* peduncled, quasi-terminal, ebracteate, of about 15 flowers. *Calyx-tube* adherent to the ovary; the limb closed, splitting up on one side a little way from the base and then circumscissile and deciduous. *Petals* 5, perigynous, linear, circinate in æstivation. *Stamens* 5, perigynous, filaments very short, connective produced as a horn. *Staminodes* about 10, horned. *Ovary* half-inferior, 2-celled; styles 2, distinct, short; ovule 1 in each cell, pendulous. *Capsule* woody, ovoid; endocarp horny, separating from the exocarp. *Seed* narrowly ellipsoid, and with pale thick iridescent testa.

MAINGAYA MALAYANA, Oliver in Trans. Linn. Soc. XXVIII, 517, t. 44. A tree 50 or 60 feet high; young branches rather slender, glabrous, pale-coloured when dry, lenticellate. *Leaves* membranous, oblong-lanceolate or elliptic, acuminate; the base broad, rounded or minutely cordate, sometimes slightly peltate; both surfaces glabrous, shining, the lower of a bright brown tint when dry; main nerves 7–10 pairs, curving upwards, slightly prominent on the lower surface only; length 6·5–9 in., breadth 2–4·5 in., petiole ·75–1 in., slender; stipules small, tomentose, caducous. *Capitules* from ·75–1 in. in diam., solitary, or two or three from a short peduncle. *Flowers* ·5 in. long, sessile; buds oblong or obovoid-oblong. *Calyx* thin, puberulous, not opening but separating in an irregular circumscissile manner. *Petals* linear, obtuse, glabrous, four or five times as long as the calyx. *Capsule* woody, ovoid, tapering into the thick pedicel, with truncate compressed apex, more than half enve-

loped by the calyx-tube, striate, minutely pubescent, ·6 in. long, ·4 in. wide at the apex. *Seeds* narrowly ellipsoid, tapering much to the apex; the testa thick, white, iridescent, with elongate reticulations. Clarke in Hook. fil. Fl. Br. Ind. II, 428.

Penang; *Maingay* 1513; *Curtis* 659. Perak; *Scortechini* 819; *King's Collector* 7330.

2. Bucklandia, Br.

A tall glabrous tree. *Leaves* alternate, acuminate, entire, long-petioled; stipules solitary or in pairs, large, oblong, coriaceous, deciduous. *Inflorescence* of 2–5 peduncled heads, at first enclosed between a pair of stipules; flowers adnate by their calyces, about 8 in a head, polygamous. *Calyx-tube* adnate to the ovary; limb 5-lobed. *Petals* in the ♂ flower linear-spathulate, fleshy, variable in number; in the ♀ fl. rudimentary. *Stamens* 10–14 (in the ♀ none); filaments long. *Ovary* half-inferior, 2-celled; styles 2, separate, soon divaricate; ovules in each cell 6 in two rows. *Capsule* nearly superior, woody, subglobose; endocarp horny, showing a tendency to separate from the exocarp. *Seeds* in each cell 6, oblong, trigonous; the upper wingless, solid, without any embryo, the lower one in each cell winged and fertile.

Bucklandia populnea, R. Brown in Wall. Cat. 7414. *Leaves* broadly ovate sub-reniform or sub-orbicular, the apex acuminate or tricuspidate, the edges entire; the base broad and rounded, subcordate or truncate, or narrowed and cuneate; both surfaces glabrous; the lower sometimes pubescent on the nerves; main nerves 5–7, radiating palmately from the base, the lower on each side slender, prominent on the lower surface; length 2·5–6·5 in., breadth 1·5–7 in.; petiole ·8–3 in., usually glabrous but sometimes pubescent; stipules oblong, sub-falcate, obtuse, ·9–1·25 in. long, slightly pubescent at the base, breadth ·25–·45 in. Griff. in Asiat. Res. XIX, 95, with two plates; Clarke in Hook. fil. Fl. Br. Ind. II, 429. *B. populifolia*, H. f. & T. in Journ. Linn. Soc. II, 86; Kurz Forest Fl. Brit. Burma, I, 445. *Liquidambar tricuspis*, Miq. Fl. Ind. Bat. I, Pt. I, 1097; and Suppl. 346, with a figure.

Perak; *Scortechini*; on Gunong Inas, elevat. 5000 feet, *Wray* 4151; on Ulu Batang Padang, about 3900 feet, *Wray* 1535. Distrib. The temperate Himalaya from Nepal to Bhotan, elevat. 5000–8000 ft.; Khasia Hills 4000–6000 feet; Burma, Java, Sumatra.

None of the Perak specimens have flowers or fruit. Scortechini's have leaves in no way differing from those from the Himalaya and Khasia mountains, except that the main nerves and petioles, even when old, are pubescent. Wray's specimens, on the other hand, have smaller ovate leaves, rarely tri-cuspidate and never sub-rotund or reniform; their petioles are sometimes slightly hairy, but their main

nerves have tufts of hair only in their axils. In all the Perak specimens the stipules are much narrower than in those from the Himalaya and Khasia mountains.

3. Rhodoleia, Hook.

Glabrous woody shrubs. *Leaves* exstipulate, evergreen, alternate, with long petioles, coriaceous, glaucous beneath. *Flowers* in few-flowered axillary pedunculate reflexed capitula surrounded by numerous whorls of coloured bracts, increasing in size from without inwards. *Flowers* unsymmetrical, hermaphrodite, adnate in the capitula by their calyces. *Calyx-tube* adherent to the lower half of the ovary; its limb annular, truncate, glandular inside. *Petals* rosy, 2–4, very unequal, unilateral, deficient in the central flowers, clawed, oblong-oblanceolate. *Stamens* 7–10, inserted with the petals; the filaments thick, elongate; the anthers linear-oblong, basifixed, 2-celled, the connective not produced. *Ovary* half-inferior, ovoid, the apex bifid, 2-celled, or 1-celled by abortion of the septum. *Style* subulate, elongate, deciduous, stigma simple. *Ovules* numerous in each cell, inserted on two biseriate axile placentas. *Capsule* sub-ligneous, bicuspidate, 2-celled, 2-valved; the valves bifid, many-seeded. *Seeds* imbricate, not winged, angular, compressed, testa crustaceous. Distrib. Two species; Hongkong and Sumatra.

Rhodoleia Teysmanni, Miq. in Versl. en Meded. K. Akad. v. Wetensch. VI, 124. *Leaves* oblong to elliptic, the apex obtuse, slightly narrowed at the base to the long petiole, both surfaces rugulose when dry; main nerves 7–9 pairs, spreading, faint; the midrib prominent beneath; length 2·5–5 in., breadth 1·5–2 in., petiole ·75–1·75 in. *Capitula* solitary, about ·75 in. long, ovoid, on decurved peduncles about ·25 in. long; the bracts broad, blunt, the outer short and glabrous, the inner longer and covered with reddish hair. *Stamens* and petals subequal, about ·5 in. long. *Ripe capsules* glabrous, about ·4 in. long, dehiscing widely for about half their length. Miq. Fl. Ind. Bat. Vol. I, pt. 2, p. 669; Suppl. 532.

Malacca; *Hervey*; *Ridley* 3289. Perak; elev. 3900 feet in Batang Padang Valley, *Wray* 1481. Distrib. Sumatra.

Order XLIII. HALORAGEÆ.

Herbs, often aquatic. *Leaves* opposite or whorled, or partly alternate, when submerged often pinnatisect, always exstipulate. *Flowers* small, axillary, solitary or fascicled, sessile or pedicelled, hermaphrodite or unisexual, the nodes between the floral whorls sometimes developed. *Calyx-lobes* 4 or 0. *Petals* 4 and epigynous, or absent. *Stamens* 8, 4 or 1, epigynous in the bisexual flowers. *Ovary* inferior, 4- 2- or 1-celled;

the styles equal in number to the cells, simple or finely lobed; ovules 4, (1 in *Hippurus*) pendulous. *Fruit* small, dry or drupaceous, with cells as in the ovary, indehiscent, or separating into its component carpels. *Seeds* 4 or 1. Distrib.; about 80 species, cosmopolitan.

Terrestrial; fruit 1-celled, 1-seeded... ... ... 1. Haloragis.
Aquatic (floating); fruit separating into its component carpels ... ... 2. Myriophyllum.

1. Haloragis, Forst.

Branching herbs. *Leaves* opposite, the upper sometimes alternate, toothed, rigid. *Flowers* minute, nearly sessile in the axils of bracts, spicate or racemose, partially unisexual or hermaphrodite. *Calyx-tube* 4–8-ribbed; lobes 4, erect, persistent, acute, valvate. *Petals* 4, coriaceous, often wanting in the ♀. *Stamens* 8, epigynous. *Ovary* 2- or 4-celled, with 4 pendulous ovules; stigmas 4 (in the females at least), sessile, feathery. *Fruit* a dry, 2–4-celled, 2–4-seeded nut; but in the following species by abortion 1-celled, 1-seeded. Distrib. Species 40; N. Asia, Australia.

Haloragis micrantha, R. Brown in Flinders Voy. II, 550. A branching glabrous herb. *Leaves* opposite, ovate, acute, denticulate; the petioles very short, diminishing in size towards the inflorescence. *Flowers* about ·05 in., on pedicels shorter than themselves, in terminal panicle-like racemes. *Sepals* triangular, much smaller than the petals. *Fruit* shining, 8-ribbed, about ·05 in. long, 1-celled, 1-seeded. Clarke in Hook. Flor. Br. Ind. II, 430; Benth. Fl. Austral. II, 482. *H. tenella*, Brongn. in Duperr. Voy. t. 68. *Gonocarpus micranthus*, Thunb. Fl. Jap. t. 15; DC. Prodr. III, 66. *Goniocarpus micranthus*, Koen. & Sims Ann. Bot. I, 546, t. 12.

At elevations of about 5000 feet on the Perak Central Range? Distrib. Malaya, China, Australia and New Zealand. Khasia mountains; at elevations of from 5000–7000 feet.

I include this as a Perak plant with some hesitation. Scortechini's specimens are not now in the Calcutta Herbarium, although his field note is.

2. Myriophyllum, Linn.

Glabrous, aquatic herbs. *Leaves* dentate-serrate or pectinate-pinnatifid, or entire, often whorled. *Flowers* small, sessile or nearly so, in the axils of floral leaves or in nearly naked spikes; monœcious or hermaphrodite. Male; calyx-tube short, limb 2–4-fid or 0; petals 2–4; stamens 2–8. Female; calyx-tube deeply 4-furrowed, limb 0 or of 4 minute lobes; petals minute or 0; ovary inferior, 4- or 2-celled; styles 2 or 4, short, usually recurved, the stigmas plumose; ovules solitary

in each cell, pendulous. *Fruit* 4-furrowed, or separating into 4 or 2 carpels. Distrib. Species 15; cosmopolitan.

Myriophyllum intermedium, DC. Prodr. III, 69. *Leaves* alternate, solitary or in fascicles of two or three, sometimes in whorls, linear, entire or serrate, ·5–1 in. long. *Fruit* axillary, oblong, only about ·05 in. long, with rounded and minutely scabrous ridges and shallow furrows between, ultimately separating into its component carpels. Miq. Flor. Ind. Bat. Vol. I, pt. 1, 634; Clarke in Hook. fil. Fl. Br. Ind. II, 433. *M. indicum*, Wight Ill. t. 102, (*exclude the fruit*). *M. variæfolium*, Hook. Ic. Pl. t. 289. *M. lineare*, Heyne MSS. *Haloragis oligantha*, W. & A. Prodr. 338; Wight Ic. t. 1061 (*not of Arn.*)

Malacca; *Griffith* (probably on Mount Ophir). Distrib. Mountains of the Malayan Archipelago and of the South of British India; Australia, New Zealand, South America.

Order XLIV. RHIZOPHOREÆ.

Trees or shrubs. *Leaves* opposite and stipulate (alternate and exstipulate in *Anisophyllea*), usually coriaceous, glabrous; stipules interpetiolar, very caducous. *Flowers* axillary, usually bisexual (unisexual in *Anisophyllea*), surrounded at the base by connate or cupuliform bracts, or ebracteate. *Calyx* more or less adnate to the ovary; limb produced beyond the ovary, 4–14-lobed; lobes valvate, persistent. *Petals* equal in number to but usually smaller than the sepals, entire, emarginate, 2-fid or lacerate. *Stamens* usually twice the number of the petals, in pairs, opposite to and partly embraced by them; rarely indefinite (*Kandelia*); anthers 2-celled, rarely multi-loculate (*Rhizophora*). *Ovary* more or less adnate to the calyx, from 5–1-celled by solution of the septa; styles connate (distinct in *Anisophyllea*); stigma often lobed; ovules usually 2 in each cell, pendulous. *Fruit* coriaceous or woody, crowned or surrounded by the calyx-limb, mostly indehiscent, 1-celled, 1-seeded. *Seed* pendulous, arillate or not; albumen fleshy or 0; embryo inverted, small if surrounded by albumen, elongated if exalbuminous; radicle macropodous in the tribe *Rhizophoreæ*, perforating the apex of the pericarp and germinating while the fruit still adheres to the tree.—Distrib. Tropical plants; many sharing with an arboreal vegetation the muddy shores of the estuaries of rivers. Genera 17, species about 70.

Leaves opposite, stipulate; style connate:—

Tribe I. Rhizophoreæ. Embryo exalbuminous, with a large radicle germinating while the fruit is still on the tree:—

Calyx 4-lobed; petals 4, entire; stamens 8; ovary 2-celled ... ... 1. Rhizophora.

Calyx 8–14-lobed; petals 8–14, 2-lobed or deeply emarginate; ovary 2–4-celled; stamens 16–28 ... ... 2. Bruguiera.

Calyx 5- or 6-lobed; petals 5 or 6, their apices ciliate or with clavate or capitate bristles; stamens 10–12 ... 3. CERIOPS.
Calyx 5- or 6-lobed; petals 5 or 6, multifid; stamens indefinite; stigma 3-lobed ... ... 4. KANDELIA.

TRIBE II. LEGNOTIDEÆ. Embryo immersed in fleshy albumen, radicle not unusually large and not germinating in the fruit:—

Flowers 5–8-merous in trichotomous cymes; calyx-tube minutely bracteolate, half-superior, the calyx-lobes erect; stigma small, not lobed ... ... 5. CARALLIA.
Flowers 5-merous, axillary, solitary or in pairs; calyx ebracteolate, half-superior, its lobes reflexed; stigma discoid, 5–10-lobed ... ... 6. PELLACALYX.
Flowers 4–5-merous, in axillary fascicles; calyx-tube ebracteolate, adnate to the base of the ovary, its lobes reflexed; stigma discoid, 5-lobed ... ... 7. GYNOTROCHES.

Leaves alternate, exstipulate; style distinct:—

TRIBE III. ANISOPHYLLEÆ. Leaves alternate and exstipulate; flowers unisexual; styles distinct ... ... 8. ANISOPHYLLEA.

1. RHIZOPHORA, Linn.

Trees. *Branches* marked by leaf-scars. *Leaves* coriaceous, glabrous, opposite, mucronate. *Stipules* large, in pairs, interpetiolar, caducous. *Flowers* rather large, on axillary 2–3-chotomously-divided and few-flowered cymes. *Calyx* 4-lobed, surrounded at the base by connate bracteoles. *Petals* 4, entire, inserted on a fleshy disc. *Anthers* 8, subsessile, multi-loculate. *Ovary* 2-celled, half-inferior, projecting beyond the calyx as a fleshy cone; cells 2-ovuled; stigma bifid. *Fruit* coriaceous, ovoid or obconic, with the reflexed persistent calyx-teeth at its base. *Radicle* elongated, perforating the apex of the fruit and descending from the tree into the mud.—DISTRIB. About 5 species; frequent on muddy tropical shores.

Leaves elliptic; cymes longer than the petioles, usually 3-flowered; petals fleshy, lanate in front ... ... 1. *R. mucronata.*
Leaves oblong to oblong-lanceolate; cymes shorter than the petioles, 2-flowered; petals thin, glabrous ... ... 2. *R. conjugata.*

1. RHIZOPHORA MUCRONATA, Lamk. Dict. VI, 160, t. 396, f. 2. A large evergreen glabrous shrub or tree; young branches thick, with bold cicatrices, rather pale. *Leaves* elliptic, tapering to each end, the apex mucronate; upper surface reticulate when dry, the main nerves faint and depressed; the lower surface minutely rugulose and with black dots, even when dry the nerves invisible; length 5–7 in., breadth 2·5–4·25 in., petiole 1·2–1·75 in. *Cymes* axillary, slightly longer than the petioles, usually 3- rarely 2-flowered. *Flowers* ·5–·6 in. long, their pedicels shorter. *Calyx-lobes* coriaceous, triangular, subacute, glabrous.

Petals shorter than the sepals, linear-lanceolate, thick, lanate on the margins and inner face. *Stamens* 8, filaments short, anthers linear. *Fruit* inversely obovoid with the reflexed persistent calyx-teeth at its base, 1·5 in. long; the extruded radicle 1–2 feet long, cylindric, ·6 in. in diam. when dry. DC. Prodr. III, 32; Bedd. Fl. Sylv., Anal. Gen. t. XIII, fig. 4; Dalz. & Gibs. Bomb. Fl. 95; Wight Ill. I, 209; Ic. t. 238; Kurz For. Flor. Burm. I, 447; Hook. fil. Fl. Br. Ind. II, 435; Trimen Flora Ceylon, I, 151. *R. macrorrhiza*, Griff. in Trans. Med. Phys. Soc. Calc. VIII, 2. *R. candelaria*, W. & A. Prodr. I, 310; Wall. Cat. 4878. *R. Mangle*, Roxb. (not of Linn.) Fl. Ind. II, 456. *R. latifolia*, Miq. Fl. Ind. Bat. Suppl. 324.—Rheede Hort. Mal. VI, t. 34.

In all the provinces, at the mouths of rivers; very common. Distrib. The Tropics of the Old World and of Australia.

The original specimens in the Calcutta Herbarium of *R. latifolia*, Miq. are only large-leaved specimens of this.

2. Rhizophora conjugata, Linn. Sp. Pl. 634. A small glabrous tree; young branches clavate, smooth, pale, the upper part with bold cicatrices. *Leaves* oblong to oblong-lanceolate, tapering to each end, the apex mucronate; when dry the upper surface faintly reticulate, the main nerves visible; the lower surface not showing the main-nerves but the midrib there prominent, remotely pustulate and minutely dotted; length 5–6 in., breadth 1·65–2·5 in., petiole ·8–1·25 in. *Cymes* axillary, shorter than the petioles, 2-flowered. *Calyx-lobes* oblong, concave, acute. *Petals* slightly shorter than the calyx, thin, glabrous. *Stamens* 6–8; filaments short, anthers linear. *Fruit* inversely clavate, 1 in. long, the protruding radicle from a few inches to a foot long, cylindric; ·25–·3 in. in diam., when dry. DC. Prodr. III, 33; Blume Mus. Bot. I, 134; Wight Ill. I, 309; Kurz. For. Flora Burma, I, 447; Hook. fil. Fl. Br. Ind. II, 436. *R. apiculata*, Blume Flor. Jav. I, 91. *R. candelaria*, DC. Prodr. III, 32; Trimen Flora Ceylon, I, 151.

In all the Provinces, at the mouths of rivers and in tidal marshes. Distrib. The Tropics of the Old World.

2. Bruguiera, Lamk.

Trees or shrubs. *Leaves* usually coriaceous, oblong, quite entire. *Peduncles* axillary, cymose, or solitary. *Flowers* rather large, coriaceous. *Calyx* 8–14-merous, obconical or campanulate, ebracteate, adnate to the base of the ovary; lobes subulate-lanceolate, valvate. *Petals* oblong, equal in number to the calyx-lobes, 2-lobed or emarginate, appendiculate, embracing the stamens by pairs. *Stamens* 16–28; filaments filiform; anthers linear, mucronate, about as long as the filaments. *Ovary* 2–4-celled, included in the calyx-tube; cells 2-ovuled; style filiform;

stigma 2–4-lobed, minute. *Fruit* coriaceous, included in or adnate to the calyx-tube, 1-celled, 1-seeded. *Germination* as in *Rhizophora*. Distrib. Species about 7, in the tropics of the Old World.

Flowers 1 in. long or upwards, solitary :—		
Petals 2-lobed, each lobe with 2–4 apical bristles, otherwise glabrous	1.	*B. gymnorhiza.*
Petals 2-lobed, the sinus between the lobes with one bristle; the edges densely clothed with short white hairs	2.	*B. eriopetala.*
Flowers not more than ·5 in. long, in axillary cymes :—		
Lobes of the calyx as long as the tube, spreading or reflexed; petals bifid, each lobe crowned by 3–5 pale hairs, their edges with scanty white hairs outside ...	3.	*B. caryophylloides.*
Lobes of calyx only one-fourth the length of the tube, erect; petals with broad emarginate apex, bearing 5 white flexuose hairs, the edges glabrous ...	4.	*B. parviflora.*

1. Bruguiera gymnorhiza, Lamk. Encycl. IV, 696; Ill. t. 397. A large glabrous evergreen tree: young branches stout, marked with cicatrices towards the apex. *Leaves* elliptic or elliptic-oblong, acute, the base cuneate; upper surface shining when dry, the nerves faint; the lower dull, the veins invisible but the midrib very prominent; length 3·5–6 in., breadth 1·75–2·5 in., petiole 1·3–1·6 in. *Flowers* solitary, axillary, 1·25–1·5 in. long; the peduncles about ·35 in., deflexed. *Calyx* coriaceous, campanulate, ribbed, cut for half its length into 12 narrow acute suberect teeth. *Petals* shorter than the calyx-lobes and equal to them in number, sub-convolute, two-lobed at the apex and with 2–4 bristles at the point of each lobe, pubescent at the base, otherwise glabrous. *Stamens* two opposite each petal and shorter than it, each alternate filament short; anthers linear. *Fruit* small, in the fundus of the calyx-tube, containing a single seed germinating *in situ* and forming a cylindric radicle 1–2 feet long prior to its fall. W. & A. Prodr. 311; Brand. For. Fl. 219; Miq. Fl. Ind. Bat. I, pt. 1, 586; Blume Mus. Bot. 136; Kurz For. Flor. Burm. I, 450; Hook. fil. Fl. Br. Ind. II, 437; Dalz. & Gibs. Fl. Bomb. 95; Trimen Flora Ceylon, I, 153. *B. Rheedii*, Miq. l. c. 587; Blume, l. c. 136; Wight Ic. t. 239; Dalz. & Gibs. Bomb. Fl. 95; Hook. Ic. Pl. t. 397. *Rhizophora gymnorrhiza*, Linn. Sp. 634; Roxb. Fl. Ind. II, 460; Griff. Ic. Pl. Asiat. t. 645; Wall. Cat. 4874; Thwaites En. Pl. Ceyl. 120.

Tidal Forests in all the provinces. Distrib. Malaya, Australia, Africa.

2. Bruguiera eriopetala, W. & A. in Wight Ill. I, p. 210; Wight Icon. 239 B. A tree; young branches slender, with cicatrices towards the apex. *Leaves* oblong-lanceolate or oval-oblong, sometimes rather oblanceolate, acute, the base very cuneate; upper surface shining, the

nerves faint; the lower reddish-brown when dry, the nerves very faint or obsolete but the midrib prominent; length 3·25–4 in., breadth 1·25–1·65 in., petiole ·6–·75 in. *Flowers* 1–1·25 in. long, solitary, axillary; the peduncle short, decurved. *Calyx* as in *B. gymnorhiza*, but the lobes only 10. *Petals* shorter than the calyx-lobes, deeply bifid, with a stout seta in the sinus between the two narrow lobes, the edges densely clothed with stout white hair, the apices of the lobes bearing one short bristle each. *Fruit* as in *B. gymnorhiza*, but the germinating radicle shorter. Wall. Cat. 2451; Brandis For. Flora, 219; Hook. fil. Fl. Br. Ind. II, 438. *B. Rumphii*, Blume Mus. Bot. Lugd. Bat. I, 138. *B. parietosa*, Griff. Notul. IV, 670; Ic. Pl. Asiat. t. 641.

In similar situations to the last, but not so common. Malacca; *Griffith* 2206; *Maingay* 642. Penang; *Curtis* 514. Pahang; *Ridley* 1045 C. Perak; *Scortechini*; *Wray* 2711. Distrib. Malayan Archipelago, Australasia.

3. Bruguiera caryophylloides, Blume Enum. Pl. Javae I. 93. A tree; young branches slender, with cicatries towards the apex. *Leaves* oblanceolate or ovate-oblanceolate, slightly oblique, acute, the base cuneate; upper surface shining when dry, the lower dull, both pale in colour and the nerves faint in both; length 2·5 to 4 in., breadth 1–1·65 in., petiole ·75–1 in. *Cymes* axillary, rather longer than the peduncles, erect, laxly 2- or 3-flowered, (rarely only 1-flowered). *Flowers* about ·4 in. long, on short pedicels. *Calyx-tube* clavate, not grooved when fresh, surmounted by about 8 linear obtuse fleshy lobes as long as itself, at first spreading, but finally reflexed. *Petals* as many as but shorter than the calyx-lobes, apex bifid, the margins with scanty white hairs outside; the apical lobes obtuse, each crowned by 3–5 flexuose pale hairs, the sinus with a single bristle. *Stamens* 16, unequal. *Fruiting-calyx* about ·5 in. long, the fruit in its fundus with the growing radicle protruding and growing to 6–8 in. in length. Arn. in Ann. Nat. Hist., I, 368; Wight Ill. 210; Miq. Fl. Ind. Bat., Vol. I, Pt. I, 589; Kurz For. Flora Burma I, 450; Hook. fil. Fl. Br. Ind. II, 438. Trimen Flora Ceylon, I, 153. *Rhizophora caryophylloides*, Jack Mal. Misc. I. 34; Hook. Bot. Misc. II, 80; Wall. Cat. 4879; DC. Prod. III, 32. *Kanilia caryophylloides*, Blume Mus. Bot. Lugd.-Bat. I, 141; Thwaites En. Pl. Ceyl. 120. *B. parviflora*, Wall. (not of Blume) Cat. 4877 C and D.

In tidal Forests like the other species of the genus; in all the provinces. Distrib. Malay Archipelago.

4. Bruguiera parviflora, W. & A. Prodr. 311; Arn. in Ann. Nat. Hist. I, 369. A shrub or small tree; young branches slender, the cicatrices distant. *Leaves* oblong-lanceolate to elliptic-lanceolate, acute, much attenuate at the base; upper surface shining and showing the

nerves faintly when dry; the lower dull and evenious; length 3–3·5 in., breadth ·8 –1·25 in., petiole ·75–1 in. *Cymes* axillary, longer than the petioles, laxly 2–5-flowered, erect. *Flowers* erect, ·4–·5 in. long, their peduncles slightly shorter. *Calyx-tube* cylindric, crowned by 8 lanceolate erect lobes about a fourth of its own length. *Petals* as many as the calyx-lobes but shorter, oblong; the apex broad, emarginate and bearing five white short hairs, otherwise glabrous. *Stamens* 16, unequal, two embraced by each petal. *Ovary* 3-celled, fruiting-calyx cylindric, ribbed, 1 in. long, the fruit concealed in it; radicle growing to 4–5 in. before falling. Wight Ill. 210; Miq. Flor. Ind. Bat. Vol. I., Pt. 1, 588; Kurz For. Flora Burma, II, 449. *B. cylindrica*, W. & A. Prod. 311. *Rhizophora cylindrica*, Roxb. Hort. Beng. 36. *R. parviflora*, Roxb. Fl. Ind. II, 461; Wall. Cat. 4877. *Kanilia parviflora*, Blume Mus. Bot. Lugd.-Bat. I, 140 t. 30; Dalz. & Gibs. Flora Bombay 95.

Tidal Forests in all the provinces. DISTRIB. Malaya.

3. CERIOPS, Arn.

Shrubs. *Leaves* opposite, ovate or obovate. *Stipules* caducous, axillary. *Cymes* condensed. *Calyx* 5–6-merous, surrounded at the base by connate bracts. *Petals* 5–6, inserted at the base of a 10–12-lobed fleshy disc, emarginate or truncate; their apices ciliate or with clavate or capitate bristles. *Stamens* 10–12, filaments inserted between the lobes of the disc; anthers 2-celled. *Ovary* 3-celled (at least above), cells 2-ovuled; style short, stigma simple. *Fruit* obovoid, the reflexed limb of the calyx persistent at its base, 1-celled, 1-seeded. *Germination* as in *Rhizophora*. DISTRIB. Species 7; river-mouths, tropics of Old World.

Flowers sessile; petals setose-ciliate at the apex; anthers linear, longer than the filaments	1.	*C. Roxburghiana.*
Flowers pedicelled; petals with 3 short clavate processes at apex; anthers ovate, acute, much shorter than filaments	2.	*C. Candolleana.*

1. CERIOPS ROXBURGHIANA, Arn. in Ann. Nat. Hist. I, 364. A glabrous dwarf tree or shrub 2–4 feet high. *Leaves* elliptic, slightly obovate, or orbicular-elliptic, the apex rounded, the edges slightly recurved, rather narrowed at the base, (often somewhat abruptly); main nerves faint on both surfaces; the upper surface shining, the lower dull; length 2·25–3·75 in., breadth 1·5–2·25 in., petiole ·75–1·15 in. *Cymes* axillary, shortly pedunculate, not branched; flowers ·2 in. long, sessile, densely crowded. *Calyx* with 5 or 6 ovate-lanceolate sub-acute lobes. *Petals* oblong-obovate, the apex emarginate or sub-truncate, setose-ciliate. *Anthers* linear, much longer than the short filaments. *Fruit* clavate, ·5 or ·6 in. long, the protruded radicle a few inches long, clavate,

deeply ridged and furrowed. Miq. Fl. Ind. Bat. Vol. I, Pt. 1, 591; Kurz For. Flora Burma, I, 448; Hook. fil. Fl. Br. Ind. I, 436; Trimen Flora Ceylon I, 153. *Rhizophora decandra*, Roxb. Hort. Beng. 36; Wall. Cat. 4875.

At the mouths of rivers, probably in all the provinces. DISTRIB. Tropical tidal forests of the old World.

2. CERIOPS CANDOLLEANA, Arn. in Ann. Nat. Hist. I, 364. A glabrous shrub or dwarf tree 3–6 feet high. *Leaves* obovate-oblong, obtuse, sometimes emarginate, much and gradually attenuate to the base, the edges slightly reflexed, main nerves slightly visible on both surfaces when dry, length 1·75–2 in., breadth 1–1·5 in., petiole ·6–1 in. Cymes axillary, peduncled, branched; flowers ·25 in. long, on short pedicels. *Calyx-lobes* 5, oblong, sub-obtuse. *Petals* oblong-obovate, the apex truncate or emarginate and with 3 short clavate appendages. *Stamens* 10, nearly as long as the petals; the anthers ovate, acute, only about a fourth of the length of the filaments. *Fruit* clavate, ·5 in. long, the protruded radicle a few inches to a foot long, (rarely longer,) gradually thickening to near the apex and then becoming acute, deeply grooved and ridged. Blume Mus. Bot. Lugd.-Bat. I, 142; Wight Ill. 209; Icones t. 240; Miq. Fl. Ind. Bat. Vol. I, Pt. 1, 590; Brandis For. Flora 218; Kurz For. Flora Burm. I, 448; Hook. fil. Fl. Br. Ind. II, 436; Trimen Flora Ceylon I, 152. *Rhizophora timorensis*, DC. Prod. III, 32.

At the mouths of rivers and in tidal swamps in all the provinces. DISTRIB. Tropics of old World.

4. KANDELIA, Wight & Arn.

A small tree. *Leaves* opposite, coriaceous, oblong, obtuse; stipules caducous. *Peduncles* axillary, dichotomously branched, few-flowered. *Flowers* rather large, white. *Calyx* 5–6-merous, surrounded at the base by connate bracteoles, adnate to the base of the ovary; lobes linear—lanceolate, valvate. *Petals* 5 or 6, bifid; the lobes multifid, segments capillary. *Stamens* indefinite, anthers small; filaments slender, exserted. *Ovary* 1-celled, half-inferior, prolonged above the calyx into a fleshy cone; style slender, stigma 3-lobed; ovules 6, fixed in pairs to a central column. *Fruit* ovoid, girt at the base by the reflexed limb of the calyx, 1-celled, 1-seeded. *Radicle* fusiform, very acuminate. *Germination* as in *Rhizophora*. DISTRIB. A single species; British India, Malaya.

1. KANDELIA RHEEDII, W. & A. Prodr. I, 310. *Leaves* narrowly elliptic-oblong, obtuse, narrowed at the base, glabrous, 2–4 in. long, the petiole ·4–·6 in. *Peduncles* longer than the petiole, 2–3-chotomous, 4–9-flowered. *Flowers* ·6–·8 in. long, white. *Fruit* 1 in. long, obovoid; the protruded radicle 6–15 in. long, cylindric, not ridged. Arn. in Ann. Nat.

Hist. I, 365; Blume Mus. Bot. 135; Wight Ill. I, t. 89; Hook. Ic. Pl. t. 362; Wall. Cat. 4876; Kurz For. Flor. Brit. Burm. I, 449. Kurz For. Flora Burma, I, 449; Hook. fil. Fl. Br. Ind. II, 437. *Rhizophora Candel*, Linn. Sp. Pl. 443; DC. Prodr. III, 32; Roxb. Hort. Beng. 36; Wall. Cat. 4876.

ANDAMAN ISLANDS, and probably also in the other provinces.

5. CARALLIA, Roxb.

Trees or shrubs. *Leaves* coriaceous, glabrous, petiolate, ovate or elliptic; stipules caducous. *Peduncles* short, rather thick. *Flowers* small, in short 3-chotomous axillary branching cymes, sessile and often crowded. *Calyx-tube* cylindric or campanulate, minutely bracteate at the base; limb 5–8-lobed, the lobes erect, short, valvate. *Petals* 5–8, inserted on the margin of a crenulated disk lining the calyx-tube, clawed, orbicular, 2-fid or entire, subserrate or lacerate at the apex. *Disc* epigynous, 10–16-lobed. *Stamens* inserted with the petals, filaments filiform; anthers small, oblong. *Style* subulate or filiform. *Fruit* small, globose, coriaceous, 1-celled, 1-seeded (*unknown in two species*). *Seed* globose-reniform, testa fibrous, embryo curved.—DISTRIB. Species about 12, natives of the Indian Ocean.

Cymes on peduncles as long as the petioles, bearing numerous crowded sessile flowers ·15 in. long	1.	*C. lucida.*
Cymes on peduncles slightly longer than the petioles, bearing from 3–5 shortly pedicelled flowers ·1 in. long ...	2.	*C. Scortechinii.*
Cymes on peduncles much longer than the petioles, bearing 3 flowers ·25 in. long on pedicels as long as themselves ...	3.	*C. eugenoidea.*

1. CARALLIA LUCIDA, Roxb. Hort. Beng. 92; Corom. Plants III, t. 211. A small glabrous tree; young branches thin, dark-coloured when dry. *Leaves* coriaceous, varying from obovate to elliptic-oblong, oval or oblong-lanceolate; the edges recurved, entire or serrulate in the upper half or three-fourths, the apex usually shortly cuspidate, the base more or less cuneate; both surfaces shining and reticulate; the main nerves numerous, spreading and interarching freely; length 2·5–3 in., breadth 1–1·75 in., petiole ·25–·35 in. *Cymes* axillary and from the axils of fallen leaves, on stout peduncles about as long as the petioles, densely umbellate, usually trichotomous. *Flowers* ·15 in. long, sessile. *Calyx-tube* cylindric, its mouth with 6 or 7 short triangular incurved teeth. *Petals* equal in number to the calyx-teeth, orbicular, crenate, clawed, not embracing the stamens. *Stamens* twice as many as and longer than the petals, the filaments much longer than the ovate anthers. *Fruit* pisiform, glabrous, pulpy, 1-celled and usually only 1-seeded. Roxb. Fl. Ind. II, 481; Wall. Cat. 4880; Wight Ic. 605; Kurz For. Flora Burma, I, 451. *C. integerrima*, DC. Prodr. III, 33; Wight Ill. t. 90;

Benth. in Journ. Linn. Soc. III, 74; Bedd. Fl. Sylvat. t. CXCIII; Dalz. and Gibs. Fl. Bomb. 96; Brandis For. Flora 219; Hook. fil. Fl. Br. Ind. II, 439. Trimen Flora Ceylon I, 155. *C. ceylanica*, *C. corymbosa*, and *C. sinensis*, Arn. in Ann. Nat. Hist. I, 371. *C. ceylanica*, Arn. Wight Ill. 211 t. 90. *C. timorensis*, Blume Mus. Bot. Lugd. Bat. I, 128? *C. octopetala*, Muell. Fl. Aust. Trop. Occ. ex Benth. in Journ. Linn. Soc. III, 74. *C. symmetria*, Blume Mus. l. c. 130.

Perak; very common. Singapore, and probably also in several of the other provinces. Distrib. Malayan Archipelago, China, Australia, British India.

DeCandolle's *C. integerrima*, published in 1828, is in my opinion merely the entire-leaved form of this very common Indian tree, the leaves of which are sometimes serrulate and sometimes entire. It is a tree which Roxburgh could not possibly have overlooked. He published and figured the serrulate-leaved form of it as *C. lucida* in his Coromandel Plants (1819), having previously given the name in his Hortus Bengalensis, p. 92. In the belief that *C. lucida* is the oldest name for this plant, I have followed Kurz in restoring it. DeCandolle's name *C. integerrima* is however adopted by Mr. Bentham, and also by Mr. Henslow who described the *Rhizophoreæ* in Hooker's Flora of British India.

2. Carallia Scortechinii, King n. spec. A shrub or small tree; young branches slender, opposite, smooth, dark-coloured when dry. *Leaves* lanceolate or ovate-lanceolate, shortly caudate-acuminate, the base slightly cuneate; the edges entire, slightly revolute when dry; both surfaces shining, the lower with sparse black dots and with the numerous spreading main nerves slightly prominent; length 2–2·75 in., breadth 1–1·25 in., petiole ·2–·25 in. *Stipules* lanceolate, ·25 in. long, caducous. *Cymes* axillary, on pedicels slightly longer than the petioles, trichotomous, spreading, not crowded. *Flowers* 3–5, rather more than ·1 in. long and about the same in width at the mouth, on pedicels nearly ·1 in. long and bracteolate at the base. *Calyx-tube* campanulate, with 5 triangular lobes half as long as itself, their apices slightly inflexed. *Petals* 5, thin, reniform, erose-crenate, clawed, each embracing a stamen. *Stamens* 10, inserted on the 10-toothed epigynous disc, unequal. *Ovary* adnate to the calyx-tube, 5-celled, with 2 axile ovules in each cell. *Style* stout, as long as the calyx-lobes, stigma 5-lobed. *Fruit* unknown.

Perak; *Scortechini* 2023; *King's Collector* 1013. Singapore; *Ridley* 5593.

The specimens collected by Scortechini are described by him as taken from a shrub 5 or 6 feet high, while those collected by Mr. Kunstler are noted as from a tree 30–40 feet in height. They resemble each other exactly both in flowers and leaves, and I have no doubt whatever that the two belong to the same species. I give this species a name with considerable hesitation; for it does not differ much from Roxburgh's description of *C. lancæfolia*. It also closely resembles *C. cuspidata*, Blume, in leaves, but has larger flowers.

3. Carallia eugenoidea, King n. spec. A tall tree; young branches slender, glabrous, reddish when fresh, black when dry. *Leaves* oblanceolate, the apex sub-acute, the base cuneate, the edges thickened and with black glandular dots, entire; upper surface shining when dry; the lower dull, the 6–8 pairs of spreading main-nerves slightly prominent; length 1·75–2·25 in., breadth ·8–1·1 in., petiole ·2–·25 in. *Stipules* in pairs, lanceolate, ·25 in. long, caducous. *Cymes* axillary, their peduncles an inch or more in length, bearing at the apex, on pedicels as long as themselves, 3 flowers ·25 in. in length. *Calyx-tube* narrowly campanulate, with 5 triangular lobes as long as itself. *Petals* apparently none. *Stamens* twice as many as the calyx-lobes; the filaments alternately shorter, inserted on the 10-lobed disc. *Ovary* occupying the tube of the calyx, 5-celled, with 2 nearly pendulous ovules in each cell; *stigma* 5-lobed. *Fruit* unknown.

Perak; *Scortechini*, 326.

In the externals of the flowers and also in its leaves this has a superficial resemblance to a *Eugenia*; but the presence of stipules and the structure of the flower show it to be a true *Carallia*.

6. Pellacalyx, Korth.

Trees with bifarious opposite petiolate entire or obscurely serrulate leaves and interpetiolar elongate caducous stipules. *Flowers* axillary, solitary or in pairs, minutely bracteolate. *Calyx* ebracteolate, its tube tubular-campanulate, adherent to the ovary at its base; the mouth expanded and with 4–6 short recurved valvate teeth. *Petals* 4–6, lacerate at the apex, inserted on the margin of the tube of the calyx. *Stamens* 8–12, incurved, inserted on the margin of the thin crenulated disc lining the calyx-tube. *Ovary* half-inferior, 5–10-celled. *Style* subulate; stigma discoid, 5–10-lobed; ovules many in each cell, fascicled, attached to the axis. *Fruit* fleshy, sub-globose, 5–10-celled, many-seeded. *Seeds* ovoid, with striate testa; albumen copious with the embryo in its axis; cotyledons flat, narrow; the radicle terete and elongate. Distrib. Two species, both Malayan.

Calyx-tube with 5 or 6 teeth; flowers 5-merous; leaves densely stellate rusty-pubescent beneath ... ... 1. *P. axillaris.*
Calyx-tube with 4 teeth; flowers 4-merous; leaves glabrous 2. *P. Saccardianus.*

1. Pellacalyx axillaris, Korth. in Van der Hoev. & De Vr. Tijdsch. III, 20, t. 2. Young branches rusty-pubescent. *Leaves* thinly coriaceous, oblong, sometimes slightly wider above the middle, the apex shortly and abruptly acuminate, the base rounded; upper surface with a few small scattered sub-stellate hairs, or sub-glabrous when old, the midrib always pubescent; lower surface boldly reticulate and stellately

rusty-pubescent; main nerves about 12 pairs, conspicuous beneath, curving sharply upwards; length 4·5–7 in., breadth 1·25–2 in.; petiole ·2–·3 in., rusty-pubescent; *stipules* lanceolate, rusty-pubescent, ·35 in. long. *Flowers* ·25–·35 in. long, on pedicels of about the same length, both rusty-pubescent. *Fruit* pisiform, fleshy, ·25 in. in diam., crowned by the persistent wide upper part of the calyx. Benth. in Journ. Linn. Soc. III, 76; Griff. Notul. IV, 420; Ic. Pl. Asiat. t. 486.

Malacca; *Griffith* 2217/1; *Maingay* 638. Penang; *Griffith*; *Curtis* 937. Singapore; *Ridley* 6917; *Anderson*, 81. Perak; *Scortechini* 119; *King's Collector*, 1049, 2036.

2. Pellacalyx Saccardianus, Scortechini in Nuov. Giorn. Bot. Ital. XVII, 143. A small tree, young branches rusty-puberulous. *Leaves* thinly coriaceous, oblong, shortly acuminate, edges entire, base rounded or cuneate; upper surface quite glabrous, shining; the lower dull, paler, slightly reticulate, glabrous or sometimes puberulous near the midrib and nerves; main nerves 7–9 pairs, rather prominent beneath, spreading and curving upwards; length 4–7 in., breadth 1·6–2 in., petiole ·25 in. *Flowers* about ·25 in. long, on slightly shorter pedicels, rusty-puberulous. *Calyx-tube* as in *P. axillaris* but only 4-cleft. *Petals* 4, broadly oblong, emarginate, irregularly toothed towards the apex, narrowed and entire at the base. *Stamens* 8. *Ovary* usually 9-celled. *Fruit* as in *P. axillaris*, but glabrous. Hemsley in Hooker's Ic. Pl. 1546.

Perak; *Scortechini* 325. *Wray* 701, 1328. Malacca; *Maingay* 639.

This differs from *P. axillaris*, Korthals, in having glabrous or nearly glabrous leaves with only 7–9 pairs of main nerves, and also in its tetramerous flowers.

7. Gynotroches, Blume.

Trees or shrubs. *Leaves* coriaceous, shining; stipules deciduous. *Flowers* small, axillary, fascicled, the peduncles joined in the middle. *Calyx* ebracteolate, 4–5-partite; segments valvate, reflexed. *Petals* 4–5, inserted below the margin of an 8–10-lobed perigynous disc, clawed, spathulate, fimbriate-lacerate. *Stamens* 8–10, inserted on the disc, filaments filiform, anthers small. *Ovary* superior, adhering by a broad base to the calyx, ovoid-globose, 3–6-angled, 3–6-celled; style columnar, furrowed, conical at the base; stigma peltate, deeply 5-lobed; lobes emarginate, recurved; ovules 4 in each cell, ascending, fascicled. *Berry* globose, 4–6-celled, many-seeded. *Seeds* small, obovoid, testa crustaceous and wrinkled, albumen fleshy, embryo terete. Distrib. Species 2, both Malayan.

Gynotroches axillaris, Blume Bijdr. 219. A tree; young branches dark-coloured, smooth. *Leaves* oblong, or elliptic-oblong to elliptic, tapering to each end; the apex shortly and rather bluntly acuminate,

the edges entire; both surfaces shining, the lower much reticulate; main nerves 9–12 pairs, spreading, curving upwards; length 3·5–5·5 in., breadth 1·25–2·5 in., petiole ·25–·35 in. *Fascicles* 6–10-flowered, axillary, shorter than the petioles. *Flowers* less than ·1 in. long, the pedicels about as long as the fruit-producing flowers, sub-dicœcious; the stamen-bearing flowers with perfect petals, but the ovary and stigma abortive; the flowers with fertile ovaries and with perfect stigmas having imperfect stamens and often abortive petals. *Fruit* a globular glabrous berry ·1–·15 in. in diam. Blume Mus. Bot. Lugd. Bat. I, 127, t. XXXI; Miq. Fl. Ind. Bat. Vol. I. Pt. I, 592; Kurz For. Flora Burma, I, 451; Hook. fil. Fl. Br. Ind. II, 440. *G. Dryptopetalum*, Blume Mus. l. c. 127; Miq. Fl. Ind. Bat. l. c. 592. *Dryptopetalum coriaceum*, Arn. in Ann. Nat. Hist. I, 372. *G. reticulata*, A. Gray. Bot. Amer. Expl. Expedit. Vol. I, 607? *Microtropis coriacea*, Wall. Cat. 4338. *Casearia? acuminata*, Wall. Cat. 7198. *Rubiacea*, Wall. Cat. 8455.

In all the provinces; common. Distrib. The Malayan Archipelago.

8. Anisophyllea, Br.

Trees and shrubs. *Leaves* exstipulate, distichous, obliquely ovate-lanceolate or elliptic, with 3–5 main nerves proceeding from the base (the nervation pinnate in one species), quite entire; the alternate leaves sometimes smaller or minute and stipuliform. *Flowers* monœcious, minute, in axillary simple or fascicled spikes, ebracteate or minutely bracteolate. *Calyx-tube* of ♀ flower ovoid, adnate to the ovary, terete or ribbed; limb 4-fid, lobes erect. *Petals* 4, small, involute, entire, lobed or lacerate. *Stamens* 8; filaments short, subulate; anthers small, didymous, usually abortive in the females. *Ovary* inferior, 4-celled; styles 4, subulate, erect or recurved, stigmas acute or subcapitate; ovules solitary in each cell, pendulous, anatropous. *Fruit* coriaceous, oblong or pyriform, ribbed or smooth, 1-seeded. *Seed* pendulous, exalbuminous, testa coriaceous, embryo clavate, cotyledons very small or 0, radicle large. Distrib. Species 10, natives of Tropical Asia and Africa.

Leaves dimorphous	1.	*A. disticha.*
Leaves uniform :—		
Flowers apetalous...	2.	*A. apetala.*
Flowers with 4 petals :—		
Petals minute, deltoid	3.	*A. Gaudichaudiana.*
Petals thick, subquadrate, entire or subemarginate	4.	*A. Griffithii.*
Petals 3-fid at the apex	5.	*A. Scortechinii.*
Petals divided to the very base into narrow segments	6.	*A. Curtisii.*

1. Anisophyllea disticha, Baill. in Adansonia, XI, 311. A shrub with ferruginous-pilose slender branches. *Leaves* dimorphous, in two

series; the longer oblong-rhomboid, subfalcate, acute, the base cuneate, subsessile, 3-nerved, puberulous or pubescent or sometimes nearly glabrous on both surfaces, ·75–1·5 in. in length and about one-third or one-quarter as much in breadth; the smaller set stipule-like, lanceolate and only ·25–·3 in. long, inserted below the larger and overlapping their bases. *Male flowers* in short few-flowered axillary fascicles and racemes much shorter than the leaves, ·05 in. in diam., on short pedicels; *calyx* with 4 broad lobes; *petals* shorter than the calyx, trifid; *stamens* 8, as long as the petals. *Female flowers* solitary, larger than the males, subsessile; *calyx-tube* elongated, tubular, pubescent externally, connate with the ovary, crowned at the apex with 4 triangular lobes; *petals* and *stamens* as in the male; *styles* stout, shorter than the petals, truncate; *stigmas* 2-lobed; *fruit* narrowly elliptic, tapering to each end, with 8 vertical grooves, glabrous; seed oblong. Hook. fil. in Herb. Kew; Hensl. in Hook. fil. Fl. Br. Ind. II, 442. *Anisophyllea trapezoidalis*, Baill. in Adansonia, XI, 311. *Anisophyllum trapezoidale*, Baill. in Adansonia, III, 24, 26. *Haloragis disticha*, Jack Mal. Misc. VII, 19; Wall. Cat. 2519; Hook. Journ. Bot. I, 371; Calc. Journ. Nat. Hist. IV, 336.

In all the provinces except the Andamans and Nicobars; common. DISTRIB. The Malayan Archipelago.

The name *Anisophyllea* was first given to this genus by Robert Brown, who however published no description of it. In 1823, Sabine (in a paper published in the *Trans. Hort. Soc. Lond.*) first used it in giving a popular description of a plant from Sierra Leone under the name *A. laurina*. Overlooking this publication, Don founded for that very plant the genus *Anisophyllum*, and named it *Anisophyllum laurinum*, and this name was published in 1849 in Hooker's *Niger Flora*, 342. In the addenda and corrigenda to that volume, Don's name is however reduced and Brown's is restored. Baillon (in *Adansonia* III, 24 and 36,) applied the generic name *Anisophyllum* to three plants of which the present species is one. But, in a subsequent volume of *Adansonia* (XI, 310 and 378) and in his *Histoire des Plantes* (VI, 304), Baillon abandons Don's name *Anisophyllum* and adopts Brown's earlier one.

2. ANISOPHYLLEA APETALA, Scortechini MSS. in Herb. Calcutt. A tree 30–40 feet high; young branches slender, glabrous. *Leaves* membranous, oblong to elliptic or ovate-elliptic, or elliptic-lanceolate, caudate-acuminate, the base rounded or slightly cuneate; both surfaces glabrous, minutely reticulate; the upper shining, the lower somewhat dull when dry; main nerves 5, springing from the apex of the petiole, the middle three bold, the two lateral rather faint; length 3–8 in., breadth 1·25–3 in., petiole ·25–·3 in. *Racemes* in lax few-branched extra-axillary panicles as long as the leaves, the rachises glabrous. *Flowers* monocious, depressed-globular, usually tetramerous, sometimes (fide Scortechini) pentamerous. *Male flowers* on pedicels longer than

themselves; *calyx* deeply cut into 4 (rarely 5) triangular thick concave segments; *petals* none; *stamens* 4, exserted, the filaments dilated at the base; *styles* and *ovary* rudimentary. *Female flowers* on the same branches as the males, sessile; *calyx-tube* slightly elongated, the lobes of the mouth smaller than in the male, staminodes shorter than the calyx-lobes; *ovary* tetragonous, included in the calyx-tube, the styles exserted; *fruit* ovoid or elliptic, tapering to each end, glabrous, with vertical purple stripes, 2–3 in. long and 1–1·25 in. in diam.; pericarp woody, thick.

Perak; *Scortechini*, 684 and 1808; *Wray* 2340, 2758; *King's Collector* 2932, 4326, 4792, 6587, 6318, 7399.

This resembles *A. Gaudichaudiana*, Baill. in the shape of its leaves which are, however, much thinner in texture and more caudate-acuminate. It differs from that, however, in having apetalous flowers, and in the males having longer pedicels. The fruit also differs, being pointed at each end and quite glabrous, whereas the fruit of *A. Gaudichaudiana* is obtuse at the ends and rusty-pubescent.

3. Anisophyllea Gaudichaudiana, Baill. in Adansonia, XI, 311. A tree 50–80 feet high; young shoots rather slender, glabrous, minutely lenticellate. *Leaves* coriaceous, broadly oblong to elliptic-oblong, entire, shortly and rather bluntly acuminate, the base rounded or slightly narrowed; both surfaces glabrous, dull when dry, with wide reticulations and 5, rarely 7, bold vertical curving main nerves springing from the apex of the petiole, the transverse connecting veins distinct; length 6–10 in., breadth 2·5–4 in.; petiole ·25–·3 in., stout, channelled, articulate at the base. *Panicles* axillary, solitary or in fascicles, much shorter than the leaves, with few short distant spicate rusty adpressed-pubescent branches. *Flowers* monœcious. *The males* depressed-globose, mostly about ·05 in. in diam., on short pedicels; *calyx* of 4 triangular concave fleshy segments; *petals* deltoid, much smaller than the calyx-lobes. *stamens* 8, incurved, pistil rudimentary. *Female flowers* sessile, longer than the males; the *calyx-tube* elongate, tubular, containing the ovary, its mouth with segments like the male; *stamens* none; *styles* 4, recurved. *Fruit* large, subpyriform or ellipsoid, sub-oblique, obtuse, minutely rusty-pubescent, 3·5 in. long, and 2·25 in. diam.; pericarp woody, ·5 in. thick. *Seed* solitary. Hook. Ic. Plant. 1551. *A. grandifolia*, Hensl. in Hook. fil. Fl. Br. Ind. II, 442. *Cocculus? ? flavicans*, Wall. Cat. 4976. *Strychnos? grandis*, Wall. Cat. 4454. *Anisophyllum flavicans*, Hook. & Thoms. Fl. Ind. 175. *A. grande*, Benth. in Journ. Linn. Soc. I, 79.

Penang; *Gaudichaud*, *Maingay* 1517, *Curtis* 521, *Stolickza*. Perak; *King's Collector* 2706, 2731, 5472; *Ridley* 3029.

On the principle by which Herr Otto Kuntze desires to guide botanical nomenclature Baillon's name *A. Gaudichaudiana* would have to give way to the name *A.*

grandis, because, although Wallich referred the plant to a family with which it has no affinity, he gave it the earliest specific name "*grandis*."

4. Anisophyllea Griffithii, Oliver in Trans. Linn. Soc. XXIII, 460. t. 48. A tree 40–50 feet high, with drooping branches; young branches slender, glabrous. *Leaves* thinly coriaceous, greenish-yellow when dry, lanceolate, ovate-lanceolate or broadly elliptic-lanceolate, the apex bluntly acuminate, the base cuneate, the edges entire and slightly revolute when dry; both surfaces glabrous and very minutely dotted, the upper shining, the lower rather dull; length 2·5–3·5 in., breadth 1·2–2 in., petiole ·15–·2 in.; a basal nerve springing from the apex of the petiole on each side and running close to the edge; main nerves pinnate, about 6 pairs, oblique, curving but slightly. *Spikes* solitary or in pairs, axillary or extra-axillary, slender, tawny-puberulous, ·75–1 in. long, (1·5–2·75 in., *fide* Oliver), laxly-flowered. *Male flowers* ·05 in. in diam., sessile; *calyx-limb* with 4 triangular coriaceous lobes; *petals* 4, shorter than the calyx-lobes, thick, broadly-oblong, subquadrate, entire or faintly emarginate; *stamens* 8, the 4 opposite to the petals attached to the latter, filaments dilated, anthers broadly-elliptic; *styles* 4, free, subulate, ovary imperfect. *Female flowers* like the males, but the *calyx-tube* elongated and containing the 4-celled ovary. *Fruit* globular-ellipsoid, obtuse at each end, glabrous, smooth, 1·75 in. long and 1·35 in. in diam. Laws. in Hook. fil. Fl. Br. Ind. II, 442.

Malacca; *Griffith* 2439. Penang; *Curtis* 148 and 1511. Perak; *King's Collector* 7600.

This differs from all other Malayan species in the pinnate venation of its leaves. There are indeed two nerves which spring along with the midrib from the apex of the petiole and run round the edges, but the midrib has pinnate branches.

5. Anisophyllea Scortechinii, King n. spec. A tree 25–30 feet high; young branches slender, rusty-tomentose. *Leaves* falcately lanceolate-rhomboidal, the apex much acuminate, the base obliquely acute; both surfaces shining, the upper quite glabrous, the lower glabrous except for a few thin scattered brown apically-directed adpressed hairs on the intercostal spaces; the nerves (and particularly the middle one) more pubescent, especially towards the base; main nerves 3, 4 (from the splitting of the middle one) or rarely 5, springing from the apex of the petiole, the middle one straight, the two lateral curved; all prominent on the lower and deeply depressed on the upper surface; connecting veins sub-horizontal, prominent; length 2·5–3 in., breadth ·6–1·25 in., petiole ·15 in. *Panicles* extra-axillary, with only 1 or 2 branches, ·5–1 in. long, rusty-pubescent. *Male flowers* ·1 in. in diam., on pedicels as long as themselves, minutely bracteolate at the base; *calyx-lobes* 4 or 5, broadly ovate-acute, not concave, reflexed; *petals*

shorter than the calyx-lobes, 3-fid at the apex; *stamens* 8; *styles* 4, conical, rudimentary. *Female flower* larger than the male and with the calyx-tube elongated and containing the ovary; lobes of the mouth broadly ovate; *stamens* 8; rudimentary styles 4, stout, as long as the calyx-lobes; *stigmas* sub-capitate. *Fruit* ellipsoid, glabrous, ·75 in. long and ·4 in. in diam., glabrous, smooth; the pericarp woody.

Perak; *Scortechini* 1807. *Wray* 960 and 2100; *King's Collector* 5681, 8821.

A species closely allied to the Bornean *A. rhomboidea*, Baill. The latter species has however leaves of thinner texture, and their main nerves are more pubescent beneath while, instead of being deeply depressed on the upper surface, they are scarcely visible. The transverse veins are also finer and less visible than in the leaves of this, while the lower surface has numerous minute white scales; the leaves of this have no scales. The petals of *A. rhomboidea* are described by Baillon as flabellate-incised.

6. Anisophyllea Curtisii, King n. spec. A tree 30–40 feet high with drooping branches; young twigs slender, deciduously and sparsely adpressed rusty-pubescent. *Leaves* thinly coriaceous, elliptic-lanceolate, slightly oblique especially towards the rather abruptly and obliquely cuneate base, gradually tapering to the caudate-acuminate apex; upper surface glabrous, not reticulate; the lower faintly reticulate, glabrous except for a few adpressed hairs near the base; main nerves 5, springing from the apex of the petiole, the two outer faint and running close to the edge, the three middle prominent on the lower surface but obsolete on the upper; length 2·5–3·25 in., breadth ·8–1·25 in., petiole ·2 in. *Male and female* flowers on distinct adpressed-pubescent spikes about ·5 in long, each flower with a short blunt bracteole at its base. *Male flowers* ·15 in. long, sessile, clavate; calyx-tube elongate, rusty adpressed-pubescent externally, its mouth with 4 broadly triangular lobes; *petals* 4, as long as the calyx-lobes or longer, cut almost to the base into filiform lobes; *stamens* 8, with filaments of unequal length, those with short filaments attached to the petals; *styles* subulate, ovary abortive. *Female flowers* ·25 in. long, the calyx-tube longer than in the male and ribbed; lobes of the mouth reflexed. *Petals* as in the male but larger and with more lobes; *stamens* as in the male; *style* as long as the petals. *Fruit* unknown.

Penang; *Curtis* 746.

A very distinct species, at once recognised by its comparatively large flowers and deeply fimbriate petals; allied to *A. rhomboidea*, Baill. and to *A. Scortechinii*, King; but well distinct from either.

Order XLV. COMBRETACEÆ.

Trees or shrubs, often climbers. *Leaves* alternate subopposite or

opposite, sometimes ternate, petioled, entire, simple (in *Illigera* 3-foliolate); stipules 0. *Flowers* bracteolate at the base, in the tribe *Gyrocarpeæ* cymose; in the *Combreteæ* spicate or racemose (the racemes often panicled); often polygamo-monœcious. *Calyx-tube* adnate to the ovary and produced above it (sometimes to a great length), the limb of 4–5 (rarely 4–7) valvate lobes. *Petals* 4–5 or 0, (rarely 6–7). *Stamens* 4–5 or 8–10, inserted on the calyx; (in the *Gyrocarpeæ* the filaments with staminodes attached at the base, and the anthers dehiscing by recurved lateral valves). *Ovary* inferior, 1-celled; style simple; stigma simple or in *Illigera* sinuate, almost lobed; ovules 1–7 (usually 2–3), pendulous from the apex of the cell. *Fruit* coriaceous or drupaceous, generally indehiscent, ovate, angular or very commonly winged; in *Calycopteris* and *Gyrocarpus* crowned by the greatly enlarged calyx. *Seed* 1, without albumen; cotyledons in *Terminalia* and others convolute; in *Combretum* and others plano-convex. DISTRIB. Species about 320, in the tropics of the whole world; and in S. Africa outside the tropics.

SUB-ORDER I. COMBRETEÆ. *Calyx-lobes* valvate; *stamens* without basal glands or staminodes; the anthers with longitudinal dehiscence. *Ovules* 2–7, suspended by long funicles. *Flowers* in spikes or racemes:—

Flowers apetalous:—	
Limb of the calyx deciduous	1. TERMINALIA.
Limb of the calyx accrescent	2. CALYCOPTERIS.
Flowers with 4 or 5 petals (except in *Combretum apetalum*):—	
Limb of the calyx persistent, leaves alternate ...	3. LUMNITZERA.
Limb of the calyx deciduous, leaves opposite:—	
Calyx-tube prolonged above the ovary for less than ·5 in.	4. COMBRETUM.
Calyx-tube prolonged above the ovary for from ·75–2·5 in.	5. QUISQUALIS.

SUB-ORDER II. GYROCARPEÆ. *Calyx-lobes* valvate or imbricate; *stamens* with glands or staminodes at their bases; anthers dehiscing by up-turned valves. *Ovule* 1, suspended by a short funicle. *Flowers* cymose:—

Scandent; leaves 3-foliolate	6. ILLIGERA.
Trees; leaves entire	7. GYROCARPUS.

1. TERMINALIA, Linn.

Large trees. *Leaves* alternate or subopposite, exstipulate, entire or slightly crenulate, often with glands on the petiole or near the base of the midrib beneath. *Flowers* small, spicate, (the spikes sometimes panicled), hermaphrodite, the upper flowers on the racemes often males and the lower hermaphrodite; a narrow deciduous bract at the base of each flower. *Calyx-tube* produced above the ovary, having a campanulate

mouth with 5 short valvate triangular lobes, deciduous. *Petals* 0. *Stamens* 10, inserted on the calyx-tube; the epigynous disc within them densely hairy. *Ovary* 1-celled, inferior; style long, simple; ovules 2 or 3, pendulous from the summit of the cell. *Fruit* ovoid, various in size and texture, smooth or angular, or with 2–5 wings, indehiscent, coriaceous. *Seed* solitary, exalbuminous, cotyledons convolute. Distrib. Species 135; in the tropics of both worlds.

Sect. I. Fruit ovoid or elliptic, sometimes compressed, never winged, but sometimes keeled at the edges or obscurely 4–5-ridged :—	
Leaves broadly oblong, lanceolate-oblong to elliptic-oblong; fruit sub-clavate, obscurely 5-ridged, glabrous, 2–3 in. long	1. *T. citrina.*
Leaves elliptic or ovate, acuminate; fruit oblong, obscurely 5-ribbed, slightly compressed on one side, ·6–·75 in. long, glabrous	2. *T. Manii.*
Leaves obovate, broadly elliptic or sub-rotund, minutely papillose on the upper surface, the petioles very long (1·75–4 in.); fruit ovoid or globular-ovoid, minutely tomentose ...	3. *T. belerica.*
Leaves obovate, tapering to a very narrow base; fruit glabrous :—	
Fruit elliptic, 2·25 in. long, with very thick corky pericarp; leaves 3–4 in. long	4. *T. phellocarpa.*
Fruit obovate-ellipsoid, plano-convex, 1·5 in. long; leaves 5–6·5 in. long...	5. *T. fœtidissima.*
Fruit ellipsoid, somewhat compressed, keeled at the edges, 2 in. long; pericarp fleshy; leaves 6–9 in. long	6. *T. Catappa.*
Sect. II. Fruit narrowly elliptic, its edges produced into 2 broad leathery wings :—	
Leaves obovate or oblong-obovate, 6–9 in. long, the petioles 2·25–2·75 in.; fruit 1·25–1·75 in. long, its breadth (including the wings) 2·5–3·5 in.	7. *T. bialata.*
Leaves spathulate-oblanceolate, 3–4 in. long, the petioles 1·15–1·5 in.; fruit ·75–1·25 in. long; its breadth (including the wings) 1·2–2 in.	8. *T. subspathulata.*

1. Terminalia citrina, Fleming in Asiat. Res. XI, 183. A glabrous tree 60–80 feet high; young shoots slender, rusty-pubescent, but at an early stage glabrous. *Leaves* thinly coriaceous, sometimes almost opposite, from broadly oblong-lanceolate to elliptic-oblong, on short bi-glandular petioles, the apex acute or shortly acuminate, the base cuneate or sometimes rounded; both surfaces when very young rusty-puberulous, afterwards perfectly glabrous and shining, the lower minutely areolate-reticulate, the bottom of the areolæ covered with white felt; main nerves 8–12 pairs, curving upwards, distinct on both surfaces when dry; length 3–6 in., breadth 1·25–2·5 in., petiole ·4 or ·5 in. *Spikes* in small panicles shorter than the leaves, axillary, deciduously rusty-puberulous.

Flowers ·2 in. in diam., sessile, all hermaphrodite, each with a deciduous linear bracteole. *Calyx* glabrous outside, rusty-villous inside, the tube oblong; glands 5, rusty-woolly. *Drupe* oblong-lanceolate, slightly clavate, smooth, glabrous, obscurely 5-ridged, 2–3 in. long, and ·75–1 in. in diam. Roxb. Hort. Beng. 33; Fl. Ind. II, 435; Wall. Cat. 3970; DC. Prodr. II, 12; Miq. Fl. Ind. Bat. I, pt. I, 602; Kurz For. Flora Burma, I, 456; Clarke in Hook. fil. Fl. Br. Ind. II, 446; W. & A. Prodr. 313; Brand. For. Fl. 223. *Myrobalanu citrina*, Gaertn. Fruct. II, t. 97.

British India.

Var. 2. *malayana*, Clarke in Hook. fil. Fl. Br. Ind. II, 447. *Petioles* ·75–1·25 in. long. *Fruit* about 1 in. long.

Nicobar Islands; *Jelinek*, *Kurz*. Malacca; *Griffith* 2178. *Maingay* 643. Perak; *King's Collector* 3173.

This species and its variety *malayana* may be readily distinguished from *T. Chebula*, Retz (which in many respects it resembles) and from every other Asiatic *Terminalia* by the peculiar areolate reticulation of the under surface of the leaves.

2. Terminalia Manii, King n. spec. A tree 20–40 feet high; young shoots slender, deciduously rusty-puberulous, lenticellate. *Leaves* thinly coriaceous, almost opposite, not crowded, scattered, elliptic or ovate, shortly and rather abruptly acuminate, the base rounded or somewhat cuneate and slightly oblique; both surfaces glabrescent or glabrous, minutely reticulate, the reticulations on the lower tesselate; main nerves 9–12 (rarely 14) pairs, spreading, curving upwards at the tips; length 3·25–6·5 in., breadth 2–3 in.; petiole ·75 in. long, often with 2 sessile oblong glands at the sides near its apex. *Panicles* lateral and terminal, with numerous spike-like rusty-puberulous ultimately glabrous branches shorter than the leaves when in flower, longer when in fruit. *Flowers* ·15 in. in diam. at the mouth, each subtended by a linear puberulous bracteole as long as itself. *Ovary* narrow, cylindric, thickened and pubescent towards the base, the upper half and the mouth glabrous outside; the mouth cupular with inconspicuous broad shallow teeth, woolly inside. *Stamens* exserted, glabrous. *Fruit* oblong, tapering a little to each end, slightly compressed on one side, obscurely 5-ridged, quite glabrous, ·6–·75 in. long, and ·3–·35 in. in diam.; pericarp crustaceous, hard, thick.

Nicobar and Andaman Islands; *King's Collectors*.

Named in honour of Mr. E. H. Man, C. I. E., Deputy Superintendent of the Andaman and Nicobar Islands, whose powerful help has made it possible to explore the Forests of these most interesting islands; a species of which the nearest ally is probably *T. citrina*, Roxb.

3. Terminalia bellerica, Roxb. Fl. Ind. II, 431. A tall tree.

Leaves clustered at the apices of the branches, coriaceous, obovate, broadly elliptic or sub-rotund, the petioles long; the apex usually broad and rounded, rarely subacute; the base slightly cuneate, sometimes slightly unequal; both surfaces puberulous when young, glabrous and reticulate when old, the upper with numerous minute papillæ; main nerves 6–8 pairs, spreading, prominent, the midrib prominent on both sides and sometimes with 2 glands near the sides of its base; length 4·5–8 in., breadth 3·5–4·75 in, petiole 1·75–4 in. *Spikes* axillary, slender, longer than the petioles, shorter than the leaves, rusty-pubescent. *Flowers* about ·25 in. in diam., those in the upper part of the spike male, those in the lower hermaphrodite. *Calyx-tube* short, stout, including the ovary, minutely tomentose, the mouth with broad triangular lobes, pubescent outside, densely villous inside. *Stamens* much exserted. *Drupe* ovoid or globular-ovoid, densely covered with minute pale tomentum, when dried obscurely 5-angled, 1 in. long and ·75 in. in diam. W. & A. Prodr. 313 (excl. syn.); Wall. Cat. 3963; Wight Ic. t. 91; Thwaites Enum. 103; Dalz. & Gibs. Bomb. Fl. 91; Brand. For. Fl. 222; Kurz For. Fl. Brit. Burma I, 455; Hook. fil. Fl. Br. Ind. II, 445; Bedd. Fl. Sylvat. t. 19; Trimen Fl. Ceyl. I, 159. *T. Gella*, Dalz. in Hook. Kew Journ. III, 227. *T. punctata*, Roth Nov. Sp. 381; DC. Prodr. III, 13. *T. eglandulosa*, Roxb. Herb. (*wrongly referred in Willd. Sp. Pl. IV*, 968). *T. moluccana*, Roxb. Hort. Beng. 33; Fl. Ind. II, 432.

Perak; *Scortechini* 1684; *King's Collector* 8778. Distrib. British India.

Roxburgh describes and figures (Corom. Plants t. 198; Fl. Ind. II, 431) a form of this with two glands at the apex of the petiole on the under surface of the leaf; but this form has not hitherto been collected in any Malayan country, and its occurrence in British India must be rare.

4. Terminalia phellocarpa, King n. sp. A tree; young branches rather slender, deciduously rusty-tomentose. *Leaves* crowded near the apices of the branches, coriaceous, obovate, blunt, tapering from above the middle to the petiole, slightly oblique at the base; both surfaces glabrous and shining, the lower widely reticulate and minutely dotted; main nerves 4–6 pairs, spreading but curving upwards; length 3–4 in., breadth 1·75–2 in.; petiole about ·8 in., thickened towards the base, rusty-pubescent. *Flowers* unknown. *Fruit* elliptic, blunt at each end, 2·3 in. long, breadth 1·5 in.; the apex with a short sharp mammilla ·15 in. long, the pericarp thick, spongy, with horizontal layers of fibrous tissue, the endocarp woody.

Singapore; on Bukit Mandai, *H. N. Ridley*.

This has been collected only once, and the specimens are without flowers. I have named it from its corky fruit. In its leaves this greatly resembles the Philippine species *T. nitens*, Presl; but that has a very much smaller fruit than this; more-

over the petioles of its leaves are glabrous, whereas in this the petioles are pubescent.

5. TERMINALIA FŒTIDISSIMA, Griff. Notul. IV, 685. A tall tree; young branches as thick as a swan's quill, puberulous, rather rough. *Leaves* coriaceous, obovate, minutely cuspidate, narrowed from above the middle to the acute base; upper surface quite glabrous, very shining when dry the lower duller, glabrous except the sparsely rusty-pubescent midrib and nerves; main nerves 7–9 pairs, spreading but curving upwards; length 5–6·5 in., breadth 2·25–3·25 in.; petiole about ·8 in., terete. *Spikes* solitary, axillary, nearly as long as the leaves, rusty-pubescent. *Flowers* nearly all hermaphrodite, about ·2 in. in diam.; their ovaries elongate, clavate, rusty-tomentose, each with a linear bracteole. *Calyx-teeth* sparsely hairy, the mouth rusty-villous inside. *Drupe* obovate-ellipsoid, subacute, plano-convex, glabrous when ripe, 1·5 in. long. Clarke in Hook. fil. Fl. Br. Ind. II, 445.

MALACCA; *Griffith*, *Maingay* 643½ and 644. DISTRIB. Burma.

6. TERMINALIA CATAPPA, Linn. Mant. II, 519. A tree 80–120 feet high; young branches stout, puberulous, becoming glabrous, the tips with large cicatrices. *Leaves* coriaceous, obovate or obovate-oblong, with a much attenuate cordate and often bi-glandular base; the petiole very short, stout, broad and channelled; both surfaces glabrous; main nerves 8–12 pairs, spreading, not prominent when dry; length 6–9 in., breadth 3·5–5 in., petiole ·35 in. *Spikes* axillary, slender, glabrous, shorter than the leaves. *Flowers* ·2 in. in diam., each with a small bracteole, those in the upper part of the raceme mostly male and shortly pedicelled, those in the lower part hermaphrodite; calyx-tube containing the ovary, conical. *Calyx* glabrous outside, the mouth villous inside. *Ovary* glabrous. *Drupe* ellipsoid, somewhat compressed, keeled all round, pointed at the base, glabrous; pericarp pulpy, endocarp woody and very hard; length 2 in., breadth 1·25 in. Willd. Sp. Pl. IV, 967; Roxb. Hort. Beng. 33; Fl. Ind. II, 430; Lamk. Ill. t. 848; DC. Prodr. III, 11; Wall. Cat. 3975; W. & A. Prodr. 313; Wight Ic. 172; Bot. Mag. 3004; Miq. Fl. Ind. Bat. I, pt. I, 599; Bedd. Fl. Sylv. t. 18; Kurz For. Fl. Brit. Burma, I, 454; Hook. fil. Fl. Br. Ind. II, 444. *T. Catappa* and *T. Badamia*, Tulasne in Ann. Sc. Nat. Ser. IV, Vol. VI, 92. *T. moluccana*, Lamk. Dict. I, 349, (not of Roxb.); DC. Prodr. III. 11; Willd. Sp. Pl. IV, 96 (excluding the synonym *T. eglandulosa*, Roxb.) *T. procera*, Roxb. Hort. Beng. 33; Fl. Ind. II, 249; Wall. Cat. 3974; Kurz For. Flora Burma, I, 454. *Terminalia* nov. spec. 168, Kurz in Journ. As. Soc. Beng. 1876, pt. II, p. 130. *T. Myrobalana*, Roth Nov. Sp. 378. *T. subcordata*, Willd. Sp. Pl. IV, 968. *T. intermedia*, Spreng. Syst. II, 359. *Juglans Catappa*, Lour. Fl. Cochinch. 703. *Catappa do-*

mestica, *C. litorea* and *C. sylvestris*, Rumph. Herb. Amboin. I, t. 68. *Badamia Commersoni*, Gaertn. Fruct. II, 97; Rheede Hort. Mal. IV, t. 3, 4.

In all the provinces; near the coast.

A magnificent species, at times attaining an enormous height, and usually with horizontal branches. The stem is frequently most picturesquely buttressed. The embryo is eatable, and is often known to Europeans in the East as the "Indian Almond." I have reduced to this *T. procera*, Roxb., the only tangible distinction between which and *T. Catappa* is said to be its obscurely 5-ridged fruit. But fruits with this peculiarity may be gathered from the same trees as those bearing the ordinary sharp-edged smooth fruit.

7. Terminalia bialata, Steud. Nomencl. II, 668. A glabrous tree 80–100 feet high; young branches stout and with large cicatrices. *Leaves* crowded at the apices of the branches, alternate, thinly coriaceous, obovate or obovate-oblong, with long petioles, the apex abruptly and shortly cuspidate, narrowed from above the middle to the cuneate and usually oblique base; upper surface shining when dry, the lower dull and paler, the reticulations rather distinct on both; main nerves 7–9 pairs, spreading, rather distinct on both surfaces when dry; length 6–9 in., breadth 2·75–4·5 in., petioles 2·25–2·75 in. *Spikes* axillary, drooping, solitary, longer than the petioles but rather shorter than the leaves, rusty-puberulous. *Flowers* ·2 in. in diam., sessile, the male flowers in the upper part, the hermaphrodite flowers in the lower, each with a minute deciduous bracteole. *Calyx* rusty-pubescent outside, densely rusty-villous inside; the lobes triangular, reflexed. *Stamens* exserted. *Ovary* villous. *Fruit* ellipsoid, tapering to each end, somewhat flattened on one side, covered with minute dense rusty tomentum and with 2 large slightly wavy, coriaceous, puberulous, horizontally striate lateral wings; length of fruit 1·25–1·75 in, breadth ·5–·75 in., the wings from 1·25–1·75 in. in width. Kurz For. Flora Burma, I, 456; Clarke in Hook. fil. Fl. Br. Ind. II, 449. *Pentaptera bialata*, Roxb. Hort. Beng. 34; Fl. Ind. II, 441; Wall. Cat. 3986.

Andaman, and probably also the Nicobar Islands. Distrib. Burma.

8. Terminalia subspathulata, King n. spec. A tree over 100 feet high; young branches rather slender, deciduously puberulous. *Leaves* alternate, crowded near the ends of the branches, coriaceous, spathulate-oblanceolate, shortly and bluntly cuspidate, tapering from near the apex to the long petiole, eglandular and sometimes slightly oblique at the base, the edges thickened and slightly revolute; upper surface glabrous and shining, the lower pale and sub-glaucous, both minutely reticulate; main nerves about 8 pairs, spreading and curving upwards, distinct; length 3–4 in., breadth near the apex 1–1·6 in., petiole 1·15–1·5 in. *Spikes* solitary, axillary, shorter than the leaves when in flower, longer

when in fruit, rusty-pubescent. *Flowers* ·15 in. in diam., those in the upper part of the spike male, those in the lower hermaphrodite. *Calyx* minutely rusty-pubescent outside; the tube narrow, sub-cylindric in the female, tapering much upwards; the mouth wide, cupular and with 5 broadly triangular shallow reflexed teeth, shortly lanate at the base. *Stamens* exserted. *Fruit* narrowly elliptic, cylindric at the ends, ·75–1·25 in. long; the edges produced into 2 coriaceous, horizontally striate, glabrous wings each ·6–1 in. wide.

Singapore; *Ridley* 5733. Malacca; *Derry* 1037. Perak; *King's Collector* 4529.

2. Calycopteris, Lamk.

A diffuse sub-scandent shrub with drooping branches. *Leaves* opposite, shortly petioled, elliptic or ovate, acuminate, entire. *Racemes* dense, axillary, and crowded towards the ends of the branches so as to form large panicles. *Flowers* small, greenish, each with a lanceolate bract. *Calyx-tube* 5-striate, produced above the ovary; limb 5-fid, persistent and much enlarged in fruit. *Petals* 0. *Stamens* 10, the five upper ones between the calyx-teeth, the five others alternate with them and lower down on the calyx-tube. *Ovary* 1-celled, inferior; *style* subulate, simple; ovules 3, pendulous from the top of the cell. *Fruit* narrowly ovoid, 5-ribbed, villous, 1-seeded, surmounted by the enlarged calyx. *Cotyledons* convolute. The only species.

Calycopteris floribunda, Lamk. Dict., Suppl. II, 41, and Ill. t. 357. A diffuse scrambling shrub, sub-scandent; young branches slender, puberulous. *Leaves* sub-coriaceous, ovate-lanceolate to ovate-oblong, sometimes shortly acuminate, the base rounded or slightly narrowed; both surfaces minutely tomentose, the upper tawny, the lower rusty and pitted; main nerves 5 or 6 pairs, ascending, curved, rather prominent beneath; length 2·5–4 in., breadth 1–2 in., petiole ·2–·3 in. *Inflorescence* rusty-tomentose. *Flowers* ·35 in. in diam., sessile, yellowish-green, each with a short lanceolate pubescent bracteole. *Stamens* unequal, but all much shorter than the linear-lanceolate calyx-lobes. *Fruit* about ·35 in. long, narrowly oblong, 5-angled, crowned by the enlarged veined calyx-lobes which often attain from ·75–1 in. in length. Brandis For. Flora 220; Clarke in Hook. fil. Fl. Br. Ind. II, 449. *Calycopteris nutans*, Kurz Journ. As. Soc. Beng. Vol. XLVI, pt. II, p. 59; For. Flora Burma, I, 468. *Getonia floribunda*, Roxb. Cor. Pl. t. 87 and Fl. Ind. II, 428; Roth Nov. Sp. 216; DC. Prodr. III, 15; Dalz. & Gibs. Bomb. Fl. 91; Miq. Fl. Ind. Bat. I, pt. I, 605; W. & A. Prodr. 315; Wall. Cat. 4013. *Getonia nutans*, Roxb. Hort. Beng. 33; Fl. Ind. II, 428; Wall. Cat. 4012; Miq. l. c.; DC. Prodr. III, 15. *Getonia nitida*, Roth Nov. Sp. 217. *Combretum sericeum*, Wall. in Herb. Calc.

PENANG; *Wallich.* SINGAPORE; *Lobb.* TRANG; *King's Collector.* ANDAMANS; *King's Collector.* DISTRIB. British India.

There is a variety of this, with glabrous leaves and with the longer stamens equalling the calyx-lobes, to which Kurz has given the varietal name *floribunda*, his name for the typical form being *C. nutans*. I have seen no specimens of the glabrous variety from any of the Malayan provinces.

3. LUMNITZERA, Willd.

Large glabrous shrubs or small trees, growing in tropical salt marshes along with Mangroves and closely resembling them in habit. *Leaves* clustered towards the ends of the branches, alternate, thickly leathery, subsessile, narrowly obovate, entire or scarcely crenate. *Flowers* in racemes. *Calyx-tube* with two adnate bracteoles near the base, oblong, narrowed at both ends, produced above the ovary; lobes 5, persistent. *Petals* 5, oblong. *Stamens* 10 in two series, or fewer. *Ovary* inferior, 1-celled; style subulate, simple; ovules 2–5, pendulous from the top of the cell. *Fruit* woody, elliptic-oblong, $\frac{1}{2}$–1 in. (including the calyx-limb), longitudinally striate or nearly smooth. *Seed* 1; cotyledons convolute.—DISTRIB. Species 2; on the shores of the tropics of the Old World and of Polynesia.

Petals scarlet; stamens twice as long as the petals and of the same colour	1. *L. coccinea.*
Petals white; stamens of the same colour and length as the petals	2. *L. racemosa.*

1. LUMNITZERA COCCINEA, W. & A. Prodr. 316. A small tree 12–40 feet high. *Leaves* oblanceolate, obtuse, 2-3 in. long. *Racemes* terminal, sometimes several together forming a panicle. *Petals* scarlet, ·25 in. long. *Stamens* 5–10 (usually 7), twice as long as the petals and of the same colour. Miq. Fl. Ind. Bat. I. pt. I, p. 606; Clarke in Hook. fil. Fl. Br. Ind. II, 452. *L. littorea*, Voigt Hort. Suburb. Calc. 39 Kurz For. Fl. Brit. Burma, I, 469. *L. pentandra*, Griff. Notul. IV, 684, and Ic. Pl. Asiat. t. 644. *Pyrranthus littoreus*, Jack Mal. Misc. II, 57; Wall. Cat. 4018.

ANDAMAN ISLANDS. PERAK; *King's Collector* 1180; *Scortechini* 1001; and probably in the Mangrove swamps of all the provinces; DISTRIB. British India, the Malayan Archipelago, North Australia and Polynesia.

2. LUMNITZERA RACEMOSA, Willd. in Ges. Naturf. Fr. Neue Schr. IV, (1803), 187. A small tree 20-40 feet high. *Leaves* oblanceolate to oval, obtuse, 1–3 in. long. *Racemes* axillary, elongating in fruit. *Petals* minute, white. *Stamens* 5–10, about as long as the petals and also white. DC. Prodr. III, 22; W. & A. Prodr. 316; Miq. Fl. Ind. Bat. I, pt. I, 606; Dalz. & Gibs. Bomb. Fl. 90; Tulasne in Ann. Sc. Nat. Ser. IV, Vol. IV, p. 103; Bedd. Fl. Sylv. Pl. XXI; Brand. For. Fl. 221;

Kurz For. Fl. Brit. Burma I, 468; Clarke in Hook. fil. Fl. Br. Ind. II, 452. *Pyrranthus albus*, Wall. Cat. 4019. *Petaloma alternifolia*, Roxb. Fl. Ind. II, 372. *Bruguiera madagascariensis*, DC. Prodr. III, 23. Rheede Hort. Mal. VI, t. 37.

In Mangrove-swamps in all the Provinces. DISTRIB. British India, the Malayan Archipelago, North Australia and Polynesia.

4. COMBRETUM, Linn.

Shrubs with long pendent or scandent branches. *Leaves* entire, petioled, opposite or more seldom alternate or ternate. *Flowers* hermaphrodite or polygamo-dicœcious, in spikes or panicles, bracteoles small. *Calyx-tube* constricted above the ovary, short or long-produced, urceolate funnel-shaped tubular or campanulate; limb 4–5-lobed, deciduous. *Petals* as many as the calyx-lobes, (0 in *C. apetalum*), placed on the calyx-limb. *Stamens* twice as many as the petals, inserted in two series with them. *Ovary* inferior, 1-celled; style 1, subulate, simple; ovules 2–5, pendent from the top of the cell. *Fruit* with 4–5 wings angles or ridges, dry, generally indehiscent. *Seed* 1; cotyledons plaited or flat, in a few species convoluted. DISTRIB. Species 160, common in the tropics of America, Africa and Asia; also in South Africa.

Flowers 5-merous; fruit 5-angled ... ... 1. *C. trifoliatum.*
Flowers 4-merous; fruit 4-angled ... ... 2. *C. tetralophum.*
Flowers 4-merous; fruit 4-winged:—
  Tube of calyx much elongate; flowers not squamose, buds ellipsoid, their apices very much pointed:—
    Flowers condensed in globose masses at the ends of the branches of the panicle ... ... 3. *C. sundiacum.*
    Flower-spikes elongated ... ... 4. *C. extensum.*
  Tube of calyx long; flowers squamose, buds globose, the apex rather acute ... ... 5. *C. chinense.*
  Tube of calyx short; buds not pointed:—
    Flowers squamose; leaves not cordate and with distinct petioles ·3–·4 in. long:—
      Fruit not compressed, its faces all narrow and equal, its wings broad and thin ... ... 6. *C. squamosum.*
      Fruit compressed, two of its faces broad and two narrow, its wings short and thick ... ... 7. *C. Wrayi.*
    Flowers not squamose; leaves cordate and with very short petioles (·05–·15 in. long):—
      Leaves glabrous except the midrib:—
        Panicle and calyx with short thick glandular hairs 8. *C. Kunstleri.*
        Panicles cinereous-tomentose; flowers puberulous; fruit black when ripe and with narrow wings ... 9. *C. nigrescens.*
      Leaves, except when old, with long adpressed hairs beneath; panicles sericeous-tomentose; fruit pale-brown when dry, with broad thin wings ... ... 10. *C. Scortechinii.*

1. Combretum trifoliatum, Vent. Choix t. 58. A powerful climber; young branches slender, terete, glabrous or puberulous; in the older branches the bark scaling off. *Leaves* coriaceous, opposite or alternate, oblong-lanceolate or oblong-oblanceolate, or narrowly elliptic, sub-acute, the base cuneate; both surfaces glabrous and shining; main nerves 5–7 pairs, spreading or ascending, distinct on the lower surface, hardly visible on the upper, reticulations indistinct; length 1·75–5·5 in., breadth ·8–2 in., petiole ·2–·25 in. *Spikes* axillary, solitary or in pairs, or terminal and in panicles, puberulous. *Flowers* ·15 in. in diam. at the mouth, densely crowded. *Calyx-tube* with a very short constriction above the ovary; the mouth wide, cupular, and with 5 broad triangular teeth, everywhere adpressed-pubescent externally. *Petals* lanceolate, slightly exceeding the calyx-lobes in length. *Disc* and bottom of the mouth of the calyx pubescent. *Stamens* exserted. *Fruit* 1·1–1·25 in. long and ·5 in. in diam., with 5 very acute angles, glabrous, dark-brown when ripe. G. Don in Trans. Linn. Soc. XV, 439; Miq. Fl. Ind. Bat. I, pt. I, 610; Kurz For. Fl. Brit. Burma I, 461; Clarke in Hook. fil. Fl. Br. Ind. II, 454. *C. lucidum*, Blume Bijd. 641. *C. undulatum* and *C. elegans*, Wall. Cat. 3993, 4003. *C. subalternans*, Wall. Cat. 4008? *Terminalia lancifolia*, Griff. Notul. IV, 685. *Embryogonia lucida*, Blume Mus. Bot. II, t. 52. *Cacoucia? trifoliata*, DC. Prodr. II, 22. *C. lucida*, Hassk. in Flora 1844, p. 607.

Trang; *King's Collector;* doubtless also occurring in other provinces. Distrib. British India, Java.

2. Combretum tetralophum, Clarke in Hook. fil. Fl. Br. Ind. II, 454. A powerful climber; young branches slender, with minute brown rusty scales. *Leaves* opposite, thinly coriaceous, oblong-elliptic, shortly acuminate, the base cuneate; upper surface glabrous, shining, the lower with scattered brown glands when young and puberulous on the midrib and nerves; main nerves 7 or 8 pairs, oblique, ascending, inconspicuous on both surfaces; length 2·5–5·5 in., breadth 1–2 in., petiole ·3–·4 in. *Spikes* axillary, solitary, much shorter than the leaves, slightly scaly below the flowers, very scaly and puberulous between them. *Flowers* ·1 in. in diam. at the mouth. *Calyx-tube* constricted above the ovary, the constricted part as long as the ovary; the mouth campanulate and with 4 ovate erect pubescent lobes. *Petals* slightly longer than the calyx-lobes but much narrower, linear. *Disc* and fundus of the mouth of the calyx rusty-villous. *Stamens* and *style* exserted. *Fruit* ·75–1 in. long and half as broad, shining, dark-coloured, the edges very acute but not winged.

Malacca; *Griffith* 2195. Perak; *King's Collector* 1012. Distrib. Siam, Borneo.

3. Combretum sundiacum, Miq. Fl. Ind. Bat. Suppl. 327. A very powerful climber; young branches closely covered with deciduous scales. *Leaves* opposite, thinly coriaceous, broadly elliptic to elliptic-orbicular, abruptly and very shortly acuminate; the base rounded, rarely slightly cuneate, sometimes unequal-sided; both surfaces glabrous, the upper punctate and with very sparse scales; the lower with the scales more numerous and white with dark centres; main nerves about 6 pairs, oblique, curving slightly, not prominent on the upper surface but slightly so on the lower when dry; length 2·75–4 in., breadth 1·8–2·75 in., petiole ·4–·8 in. *Panicles* axillary and terminal, umbellate, longer than the leaves, the branches ending in dense globose minutely bracteolate spikes. *Calyx-tube* about ·35 in. long, minutely pubescent, not scaly, 4-ridged along the ovary, above it cylindric, expanding upwards into a funnel-shaped mouth with 4 narrowly triangular-acuminate reflexed lobes; calyx inside with a ring of hairs at its base but not filled with long coarse hair, narrowly ovate and very acute in bud. *Petals* much shorter than the calyx-lobes, oval, not clawed, glabrous. *Stamens* exserted. *Fruit* about 1 in. long and nearly as broad, with 4 coriaceous horizontally-striate shining wings, and with a few minute scattered scales. Clarke in Hook. fil. Fl. Br. Ind. I, 458.

Malacca; *Maingay* 648. Singapore; *Hullett* 89; *Ridley* 4668. Perak; *Scortechini* 1016. *King's Collector* 4360, 4452, 5864, 7827; *Wray* 4272.

Readily recognised by its panicled inflorescence, the branches being umbellate and each ending in a globose spike of flowers with very acute buds which are not scaly.

4. Combretum extensum, Roxb. Hort. Beng. 28; Fl. Ind. II, 229. A large climber; young shoots rather slender, sometimes angled, very sparsely lenticellate. *Leaves* opposite or nearly so, coriaceous, broadly elliptic to sub-rotund, rarely ovate, the apex shortly and abruptly acuminate or sub-acute; the base broad and rounded, rarely slightly cuneate; both surfaces glabrous; the lower reticulate, punctate and slightly rough; main nerves 6 or 7 pairs, spreading, interarching a little way from the edge; length 4·5–7 in., breadth 2·75–4 in., petiole ·6–1·5 in., stout. *Spikes* axillary and solitary, or sometimes in few-branched panicles, rarely terminal, often as long as or longer than the leaves, puberulous. *Flowers* ·25 in. wide at the mouth when expanded; the buds ovate, very acute at the apices. *Calyx-tube* very long, (·35 in.) infundibuliform, puberulous; the mouth ·15 in. long, deeply cut into 4 triangular acuminate reflexed lobes. *Petals* ovate-truncate or obovate, shorter than the calyx-lobes; calyx with a ring of hairs at the throat inside, otherwise nearly glabrous. *Fruit* when fully ripe about 1·25–1·5 in. long, and (including the wings) nearly as broad, wings scariose,

glabrous or glandular-puberulous. Wall. Cat. 3996; G. Don in Trans. Linn. Soc. XV, 422; Miq. Fl. Ind. Bat. I, pt. I, 608; Kurz For. Fl. Brit. Burma I, 463; Clarke in Hook. fil. Fl. Br. Ind. II, 458. *C. rotundifolium*, Roxb. Fl. Ind. II, 226; Wall. Cat. 3995. *C. Wightianum*, Wall. Cat. 4007; W. & A. Prodr. 317; Wight Ic. t. 227; Dalz. & Gibs. Bomb. Fl. 90. *C. Horsfieldii*, Miq. l. c. 609; Kurz in Flora 1871, p. 289. *C. platyphyllum*, Heurck & Muell.-Arg. Obs. Bot. 242; Kurz in Journ. As. Soc. Beng. 1874, pt. II, 188. *C macrostachyum*, Wall. Cat. 3997. *C. latifolium*, Blume Bijd. 641; Miq. l. c. 609. *C. leucanthum*, Heurck & Muell.-Arg. Obs. Bot. 240. C. *formosum*, Griff. Notul. IV, 682, (*fide* Kurz).

Malacca; *Derry* 386. Andaman Islands; very common. Not common in the other Provinces. Distrib. British India.

5. Combretum chinense, Roxb. Hort. Beng. 28. A powerful climber; young branches slender, terete, with sparse minute scales. *Leaves* opposite, or in whorls of three (var. *ternatum*), thinly coriaceous, elliptic or elliptic-oblong, sometimes obovate, shortly and abruptly acuminate, the base slightly narrowed; both surfaces glabrous, sparsely squamulose like the young branches and inflorescence, the upper surface of a dark colour when dry, the lower pale-brown (pubescent in var. *pubescens*); main nerves 7 or 8 pairs, spreading, curved, slightly prominent on the lower surface, scarcely visible on the upper; length 3·25–5 in., breadth 1·5–2·25 in., petiole ·15–·4 in. *Spikes* solitary, axillary, longer than the leaves, many-flowered; the bracteoles linear, deciduous. *Calyx-tube* ·25 in. long, slender at the base, expanding into a funnel-shaped mouth ·15 in. in diam. when fully expanded, with 4 deep erect triangular acute scaly lobes, globular when in bud but the apex acute. *Petals* broadly obovate, clawed, longer than the lobes of the calyx, glabrous. *Disc* and interior of calyx fulvous-pubescent. *Fruit* 1–1·25 in. long and ·8–1 in. broad, with 4 slightly unequal scarious coriaceous horizontal striate sparsely squamulose wings. Roxb. Fl. Ind. II, 230 (*not of G. Don*); Kurz For. Flora Burma, I, 463; Clarke in Hook. fil. Fl. Br. Ind. II, 457. *? C. Griffithii*, Heurck and Muell.-Arg. Obs. Bot. 231.

Andaman Islands; very common. Perak; *Wray* 2314, 2743. *King's Collector* 4646.

Var. *ternatum*; Clarke in Hook. fil. Fl. Br. Ind. II, 453; leaves often in whorls of three, usually obovate. *C. ternatum*, Wall. Cat. 4002.

In the Andamans (doubtful). Distrib. Chittagong. Burma.

Var. *Porterianum*, Clarke in Hook. fil. Fl. Br. Ind. II, 457; leaves elliptic-oblong, acuminate, never obovate, main nerves about 8 pairs. *C. Porterianum*, Wall. Cat. 4000.

Penang.

This variety does not appear to have been collected since Wallich's time. I much doubt whether it is worth keeping up even as a variety.

Var. *pubescens*, King. *Leaves* pubescent in the under surface.

Perak; *King's Collector* 889.

6. Combretum squamosum, Roxb. Fl. Ind. III, 231. A large creeper; young branches slender, cylindric, covered (like almost all other parts of the plant) with scales with broad pale margins. *Leaves* opposite, thinly coriaceous, broadly elliptic or elliptic-rotund, rarely ovate-lanceolate, shortly and abruptly acuminate; the base rounded, rarely sub-cuneate; both surfaces dull when dry and scaly, but without hairs; length 3·25–5·5 in., breadth 2·25–4·5 in.; petiole ·3–·4 in., scaly. *Spikes* axillary or terminal, solitary or in panicles, shorter than the leaves, few-branched. *Flowers* ·15 in. in diam. at the mouth. *Calyx-tube* shortly constricted above the 4-angled ovary; the mouth cupular, with 4 broadly triangular teeth. *Petals* small, obovate. *Disc* and fundus of mouth of calyx fulvous-villose. *Fruit* ·75–1·5 in. long and nearly as broad (including the wings), with 4 wide thin membranous wings, squamose at the bottom of the deep grooves between the wings. Wall. Cat. 3987; Miq. Fl. Ind. Bat. I, pt. I, 607; G. Don in Trans. Linn. Soc. XV, 438 (*inaccurate as to the floral symmetry*); W. & A. Prodr. 317; Kurz For. Fl. Brit. Burma I, 463; Clarke in Hook. fil. Fl. Br. Ind. II, 456. *C. lepidotum*, Presl Bemerk. 142 (*see Kurz in Flora 1871, p. 289*). *C. Maluloea*, Wall. Cat. 3991.

Malacca; *Maingay* 648. Andaman Islands. Perak; *King's Collector* 5083. Penang; *Wallich*, *King's Collector* 1335, *Curtis* 258.

A species easily recognised by being everywhere covered with scales. Some of the Penang specimens have ovate-elliptic leaves; otherwise they do not differ from specimens from other places.

7. Combretum Wrayi, King n. spec. Young branches slender, striate when dry, glabrous but slightly scaly. *Leaves* opposite, coriaceous, narrowly elliptic, subacute or very shortly and bluntly acuminate, the base rounded; both surfaces reticulate, the upper glabrous and shining; the lower dull, glabrous elsewhere, but with some coarse hairs along the sides of the midrib near its base; main nerves 6 or 7 pairs, ascending, curved, slightly prominent beneath; length 2·5–3·5 in., breadth 1·15–1·5 in.; petiole ·35–·4 in., rather rough when dry, those in the upper part of the stem and in the axils of which the spikes arise much smaller. *Spikes* axillary, solitary, about 1 in. long, the peduncles glabrous, the floriferous part pubescent and scaly. *Flowers* few, in clusters of 2 or 3. *Calyx-tube* ·15 in. long, shortly constricted above the ovary, the mouth campanulate and deeply cut into 4 triangular acute erect

teeth, every part densely covered with brown scales externally. *Petals* slightly exceeding the calyx-lobes, oblanceolate, obtuse, glabrous, erect. *Stamens* 8, exserted. *Fruit* compressed, ovate, pointed at each end, dark-brown when dry, with 4 short wings, about 1·2 in. long and ·6 in. broad on the compressed surfaces, the other two surfaces narrow and grooved, all parts sparsely scaly.

Perak; sea-shore at Matang, *Wray* 2504.

8. Combretum Kunstleri, King n. spec. A powerful climber; young shoots slender, terete, very slightly puberulous and with very few scattered rusty hairs intermixed. *Leaves* opposite, narrowly elliptic or elliptic-oblong, shortly and bluntly acuminate, slightly narrowed to the minutely cordate base; upper surface glabrous except the minutely pubescent midrib, shining; the lower dull, glabrous even on the midrib; main nerves 5–7 pairs, ascending, curving, length 3–5·5 in., breadth 1·1–1·85 in.; petiole ·1 in. or less, glabrous. *Panicles* axillary and shorter than the leaves or terminal and much longer, pedunculate, with many short thick glandular hairs, the branches rather short and spreading, bracteoles shorter than the ovaries. *Calyx-tube* about ·1 in. long, constricted both below and above the ovary, the limb widely campanulate and with 4 very shallow broad reflexed teeth, clothed outside with glandular hairs. *Petals* inserted near the edge of the calyx-limb and projecting beyond its lobes, broadly ovoid, reflexed, pubescent. *Fruit* 4-winged, tapering to the ends (when young), unknown in the ripe state.

Perak; *King's Collector* 3435, 6664; *Scortechini* 2014.

9. Combretum nigrescens, King n. spec. A slender climber 20–40 feet long; young branches rusty-puberulous and with sparse long rusty-silky hairs. *Leaves* opposite, membranous, black when dry, narrowly elliptic to oblong, shortly acuminate, the base rounded, the petioles very short; upper surface shining, glabrous except the rusty-sericeous midrib; lower surface with the midrib and main nerves rusty-sericeous, the intercostal spaces almost glabrous; length 2·25–2·75 in., breadth ·75–1 in., petiole less than ·1 in. *Panicles* terminal, lax, spreading, longer than the leaves, minutely cinereous-tomentose with a few long rusty hairs intermixed, the branches interruptedly spicate, bracteoles shorter than the calyx-tube. *Calyx-tube* only about ·05 in. long; the limb rather longer, campanulate and with 4 rather shallow broad acute teeth, puberulous on the outer surface, pubescent on the inner, with a wing of hairs in the throat. *Petals* about as long as the calyx-lobes, broadly ovate or slightly obovate, blunt, puberulous on the outer surface, sericeous on the inner. *Stamens* 8, unequal, the outer row the longest. *Fruit* black when dry, shining, glabrous, with 4 narrow wings, ·8 in. long and ·4 in. broad.

Perak ; *King's Collector* 3469, 8140.

10. Combretum Scortechinii, King n. spec. Young branches slender, softly sericeous-tomentose. *Leaves* opposite, thinly coriaceous, oblong-elliptic or sometimes oblong-oblanceolate, the base rounded or very minutely cordate ; upper surface shining, glabrous except the depressed rusty-sericeous midrib ; lower surface reticulate, with many long adpressed hairs near the base and along the prominent midrib, the nerves and intercostal spaces with shorter scattered hairs, when old almost glabrous ; main nerves about 7 pairs, ascending, curved, prominent on the lower surface, slightly depressed on the upper, length 3·25–4·5 in., breadth 1·4–1·75 in., petiole ·1–·15 in. *Panicles* axillary and terminal, shorter than the leaves ; the branches few, short and few-flowered, everywhere softly sericeous-tomentose. *Calyx-tube* ·1 in. long, cylindric ; the mouth slightly longer, widely campanulate, with 4 shallow broad acute reflexed teeth, softly tomentose like the tube. *Petals* 4, inserted near the edge of the calyx and projecting beyond it, broadly ovate-lanceolate, reflexed, pubescent. *Stamens* 8, exserted. *Fruit* with 4 thin sub-coriaceous wings, pointed at each end, glabrous, 1·25 in. long, and ·65 in. broad.

Perak ; *Scortechini.*

Collected only once, and the specimens are few.

5. Quisqualis, Linn.

Large shrubs scandent or subscandent. *Leaves* opposite, oblong or obovate, acuminate, entire. *Flowers* large, in short axillary or terminal spikes. *Calyx-tube* slender and much prolonged above the ovary, deciduous, its limb 5-lobed. *Petals* 5. *Stamens* 10, short. *Ovary* 1-celled ; style filiform, partially adherent to the calyx-tube, stigma sub-capitate ; ovules 3 or 4, suspended from the apex of the loculus. *Fruit* dry, 5-angled or 5-winged, coriaceous, subindehiscent. *Seed* solitary, cotyledons plane. Distrib. Species 5, tropical Asian or African.

Calyx-tube less than 1 in. long	... ...	1. *Q. densiflora.*
Calyx-tube from 1·5–2·5 in. long	... ...	2. *Q. indica.*

1. Quisqualis densiflora, Wall. Cat. 4011. Young branches minutely rusty-puberulous. *Leaves* elliptic-oblong or oblanceolate-oblong, shortly acuminate, the base rounded or minutely cordate ; upper surface glabrous except the pubescent midrib and main nerves ; lower surface glabrous, the 6 pairs of curved ascending main nerves with tufts of hair in their axils ; both surfaces shining and minutely papillose ; length 3·5 to 4·5 in., breadth 1·5–2 in. ; petiole ·2–·3 in., pubescent on the upper surface. *Spikes* axillary and solitary, or terminal and almost panicled, rusty-pubescent ; bracteoles lanceolate, sub-persistent, rusty-

pubescent, ·5–·75 in. long. *Calyx-tube* produced beyond the ovary for ·25–·5 in., cylindric, rusty-tomentose; its mouth funnel-shaped and deeply divided into 5 narrow lanceolate-subulate lobes. *Petals* shorter than the calyx-lobes, oblong, obtuse, about ·2 in. long, scarlet, rusty-pubescent on the outer side, nearly glabrous on the inner. *Fruit* oblong, shining, with 5 rather narrow unequal thin coriaceous wings, 1 in. long and ·65 in. broad.

Penang; *Wallich.* Perak; *Wray* 3353.

2. Quisqualis indica, Linn. Sp. Pl. 556. Young branches deciduously rusty-pubescent. *Leaves* elliptic, shortly acuminate, the base rounded; both surfaces more or less rusty-pubescent, nearly glabrous when adult except the midrib and nerves, always minutely papillose; main nerves 6–8 pairs, ascending, little curved, length 3–4 in., breadth 1·5–2 in., petiole about ·3 in. *Spikes* axillary, their rachises shorter than the leaves, many-flowered, very unequal, rusty-tomentose; bracts lanceolate, sub-persistent, ·35 in. long, pubescent. *Calyx-tube* produced beyond the ovary for 1·5–2·5 in., its mouth short, funnel-shaped and divided into 5 broad triangular acute lobes. *Petals* oblong or oblong-rotund, obtuse, ·5 in. or more in length, red, puberulous. *Fruit* narrowly ellipsoid, tapering much to the apex, less so to the base, sharply 5-angled, almost 5-winged, glabrous and of a deep brown colour, ·75–1·25 in. long and from ·3–·45 in. broad. Lour. Fl. Cochinch. 336; Lamk. Ill. t. 357; DC. Prodr. III, 23; Roxb. Fl. Ind. II, 427; Wall. Cat. 4010; Wight Ill. t. 92; W. & A. Prodr. 318; Miq. Fl. Ind. Bat. I, pt. I, 610; Brandis For. Fl. 220; Clarke in Hook. fil. Fl. Br. Ind. II, 459; *Q. villosa*, Roxb. Fl. Ind. II, 426; Spreng. Syst. II, 331; DC. Prodr. III, 23. *Q. glabra*, Burm. Fl. Ind. t. 28. *Q. pubescens*, Burm. Fl. Ind. t. 35. *Q. ebracteata*, Beauv. Fl. Owar. t. 35. *Q. Loureiri*, G. Don Gen. Syst. II, 667. *Q. sinensis*, Lindl. in Bot. Reg. N.S. Vol. XXX, t. 15. *Q. longiflora*, Presl Epimel. 216. *Quisqualis sp.*, Griff. Notul. IV, 683. Rumph. Herb. Amboin. V, t. 38.

Malacca, and probably truly wild; in the other provinces often cultivated as a garden plant. Distrib. Burma.

6. Illigera, Blume.

Scandent shrubs. *Leaves* alternate, petioled, with three entire petioluled leaflets. *Flowers* in elongate lax peduncled cymes; bracteoles 1–3 at the base of each flower. *Calyx-tube* shortly constricted above the ovary; limb of 5 valvate oblong deciduous lobes. *Petals* 5, valvate, oblong, alternate with and as long as the calyx-lobes. *Stamens* 5, epigynous, filament near the base carrying on each side a staminode; anthers dehiscing by lateral valves. *Ovary* 1-celled; style, 1, filiform,

ending in a dilated undulate sinuate stigma; ovule 1, pendulous from the apex of the cell. *Fruit* broadly 2–4-winged (2-winged in the known Indian species), the wings veined. *Seed* with plano-convex (not convoluted) cotyledons. DISTRIB. Species about 7, extending from Khasia to Singapore, Malaya and the Philippines; and one aberrant species in Angola having 5 leaflets.

Main nerves of leaves 2 or 3 pairs, oblique ...	...	1. *T. appendiculata.*
Main nerves of leaves 12–14 pairs, horizontal...	...	2. *T. lucida.*

1. ILLIGERA APPENDICULATA, Blume Bijdr. 1153; Nov. fam. exp. p. 14. A powerful climber 40–80 feet long; young branches slender, tawny-pubescent, soon becoming glabrous, striate when dry. *Common petiole* about 3 in. long, with an annular swelling at the base, glabrous or glabrescent. *Leaflets* thinly membranous, very variable in shape, often oblique, oblong, elliptic to sub-rotund, the apex shortly acuminate acute or sub-acute; the base cuneate or rounded, sometimes unequal-sided; upper surface usually glabrous; the lower very minutely lepidote, glabrous or pubescent all over or only on the 2 or 3 pairs of oblique indistinct main nerves; length 3–5·5 in., breadth 1·75–4 in., petioles ·2–·6 in. *Panicles* pendulous, very lax, 9–15 in. long, glabrous below but usually pubescent towards the extremities, the branches cymose. *Flowers* ·2–·35 in. in diam., on pubescent pedicels shorter than themselves. *Calyx* puberulous. *Petals* lanceolate, narrower than the lobes of the calyx, their midribs thick. *Stamens* curved inwards, longer than the staminodes when unfolded. *Fruit* narrowly oblong, tapering at the ends, 4-angled, minutely tomentose, 1–1·25 in. long, two of its margins produced into broadly oblong obtuse horizontally striate puberulous leathery wings 1·25 in. or more in width. DC. Prodr. XV, pt. I, 251; Kurz For. Flora Burma, I, 469. *I. Coryzadenia*, Meissn. DC. Prodr. XV, Pt. I, 251; Clarke in Hook. fil. Fl. Br. Ind. II, 460; *Coryzadenia trifoliata*, Griff. Notulæ, IV, 356.

Common in PERAK and the ANDAMAN ISLANDS, and probably to be found in all the other Provinces. DISTRIB. British India, in Burma and Assam.

Variable in the shape and pubescence of the leaflets, the under surfaces of some being rather densely pubescent, while others are almost quite glabrous. For a form of the latter sort, the under surfaces of which are moreover somewhat glaucous, Kurz suggested the varietal name *pubescens*. Individual plants vary also as to the size of their flowers. The following, which I treat as a variety, was made a species by Clarke in Hooker's Flora of British India.

VAR. *Kurzii*, *leaves* glabrous, not lepidote, very coriaceous, the margin recurved and thickened. *I. Kurzii*, Clarke l. c.

MALACCA; *Maingay* 650, 649.

2. Illigera lucida, Teysm. & Binn. Nat. Tijds. Ned. Ind. XXVII, 29. A slender climber; young shoots puberulous, angled when dry. *Common petiole* ·75–2 in. long, glabrous. *Leaflets* membranous, oblong or elliptic-oblong, often oblique, the apex shortly and bluntly acuminate; the base rounded and usually minutely cordate; both surfaces glabrous and shining; the lower reticulate; main nerves 12–14 pairs, horizontal, interarching far from the edge, slightly prominent on the lower surface, obsolete on the upper; length 3–5 in., breadth 1·25–2·25 in., petiole ·15–·3 in. *Panicles* axillary and terminal, very lax; the ultimate branches sparse, few-flowered. *Flowers* ·3 in. in diam., on thin puberulous pedicels. *Calyx-lobes* oblong, sub-acute, glabrous except for a patch of white hairs at the base in front. *Petals* about as long as the calyx-lobes but much narrower, villous at the base. *Stamens* shorter than the petals, the anthers large, the filaments villous in the lower half. *Fruit* (*fide* T. & B.) 4-winged, two of the wings larger than the other two, glabrous, about 1 in. long. Miq. Fl. Ind. Bat. Vol. I, pt. I, 1094.

Perak; *Scortechini* 1610, *Curtis* 3182. Distrib. Java.

This differs from *I. appendiculata*, Bl. in having narrower leaflets, with much shorter petioles and more numerous nerves which are quite horizontal. The leaves are moreover quite glabrous and shining. The Perak specimens from which the above description has been taken agree absolutely with type specimens of *I. lucida* received at the Calcutta Herbarium from the Buitenzorg Botanic Garden.

7. Gyrocarpus, Jacq.

A tall tree. *Leaves* alternate, long-petioled, large, entire or lobed, clustered towards the ends of the branches. *Flowers* small, unisexual, very numerous, clustered in large branched cymes without bracts. *Male* flowers very numerous; calyx 4–7-partite; *petals* 0; *stamens* 4–7, inserted at the base of the calyx with as many alternate clavate glands; *anthers* 2-celled, dehiscing by valves; *ovary* 0. *Female* or *hermaphrodite* flowers few; *calyx-tube* adherent to the ovary, limb 2-partite, persistent, enlarging in fruit; *petals* and *stamens* 0; *ovary* 1-celled; style 0, stigma sessile; ovule solitary, pendulous from the apex of the cell. *Nut* bony, crowned by the elongate spathulate coriaceous calyx-lobes. *Seed* with convolute cotyledons. A single species.

Gyrocarpus americanus, Jacq. Select. Am. 282. t. 178. Young branches stout, glabrous. *Leaves* membranous, broadly rotund-ovate, acuminate, the base broad and sometimes sub-cordate; the base usually 5-nerved, the midrib with about 3 pairs of main nerves; length 4·5–6 in., breadth 4 or 5 in., petiole 3–5·5. *Fruit* sub-globular, about 1 in. in diam., minutely pubescent; the wing narrowly spathulate, ·3 in. long. *G. Jacquinii*, Gaertn. Fruct. II. 92; Roxb. Hort. Beng. 11, Cor. Pl. t.

1; Fl. Ind. I, 445; Lamk. Ill. t. 850; Bedd. Fl. Sylv. t. 196; Kurz For. Fl. Brit. Burma I, 470; Clarke in Hook. fil. Fl. Br. Ind. II, 461. *G. asiaticus*, Willd. Sp. Pl. IV, 982; Wall. Cat. 968; Miq. Fl. Ind. Bat. I, pt. I, 978; DC. Prodr. XV, pt. I, 248. *G. acuminatus*, Meissn. in DC. Prodr. XV, pt. I, 248. *G. sphenopterus* and *G. rugosus*, R. Br. Prodr. 405.

On the Sea-Coast in all the provinces. DISTRIB. Tropics generally.

The anthers of this species are two-celled and dehisce by upward-opening valves. Those of the genus *Hernandia* are also 2-celled, but dehisce by valves which open laterally. In habit and form of leaves *Gyrocarpus* much resembles *Hernandia*; whereas it is quite an aberrant form amongst *Combretaceæ*, as is also *Illigera*.

Materials for a Flora of the Malayan Peninsula.—*By* GEORGE KING, K.C.I.E., M.B., LL.D., F.R.S., *Superintendent of the Royal Botanic Garden, Calcutta.*

No. 10.

I had hoped in the present contribution to have completed, for these *Materials*, my account of the whole of the remaining Natural Orders of *Calycifloræ*. This hope has, however, been frustrated by sickness. I have decided therefore to offer now to the Society the account of the five Orders which I have been able to elaborate; trusting, at some time in the near future, to deal with the remaining Orders of the Class. Following the sequence adopted by Sir Joseph Hooker in his Flora of British India, those treated of in the present paper come to be numbered as below; Nos. 48 *Lythraceæ*, 49 *Onagraceæ*, 50 *Samydaceæ*, 52 *Cucurbitaceæ*, and 56 *Araliaceæ*. And those which remain to be described would be Nos. 46 *Myrtaceæ*, 47 *Melastomaceæ*, 51 *Passifloraceæ*, 53 *Begoniaceæ*, 54 *Ficoideæ*, 55 *Umbelliferæ*, and 57 *Cornaceæ*. After finishing the *Calycifloræ*, I hope, in collaboration with my friend and successor Dr. D. Prain, to describe the families which are embraced in the gamopetalous and apetalous groups.

Order XLVIII. LYTHRACEÆ.

Trees, shrubs or herbs; branches often quadrangular. *Leaves* entire, opposite, sometimes alternate or whorled; stipules 0. *Inflorescence* various, often in cymes or panicles. *Flowers* hermaphrodite, regular,

rarely oblique, unisexual in *Cyrpteronia*. *Calyx-tube* free, persistent lobes 3–6, valvate, some accessory often added. *Petals* as many as the calyx-teeth, rarely 0, inserted near the mouth of the calyx-tube. *Stamens* definite or numerous, inserted on the calyx-tube. *Ovary* free in the bottom of the calyx-tube (rarely inferior), 2–6-celled, style long; stigma capitate, rarely 2-lobed; ovules numerous, placentas axile (rarely parietal). *Fruit* coriaceous or membranous, free or more or less adnate to the base of the calyx, 2–6-celled or (by absorption of the partitions) 1-celled, dehiscent or indehiscent. *Seeds* numerous, various in shape, angular, sometimes winged; albumen none; embryo straight, (cotyledons convolute in *Sonneratia* and *Punica*.) DISTRIB. Species about 275 in tropical regions and especially in those of the New World; a few in temperate zones.

Tribe I. AMMANNIÆ. Herbs, mostly sub-aquatic, with small or minute flowers; the calyx membranous ... ... 1. AMMANNIA.

Tribe II. LYTHREÆ. Trees or shrubs with moderate or large-sized flowers (minute in *Crypteronia*), large often wrinkled petals, and coriaceous or herbaceous calyx.

Stamens not more than 12.

Calyx 6-toothed; petals 6; stamens 12; capsule circumscissile, 1-celled; seeds cuneate-obovate, angled ... 2. PEMPHIS.

Calyx 4- or 5-toothed; petals 0; flowers numerous, minute, racemose, sub-unisexual; stamens 4 or 5; capsule 2-celled and 2-valved; seeds minute, narrowly winged on one side ... ... 3. CRYPTERONIA.

Stamens indefinite.

Seeds free, not imbedded in pulp.

Stamens in 2 or more rows; capsule 3–6-celled; seeds large, winged laterally ... ... 4. LAGERSTRŒMIA.

Stamens in a single row; capsule 4–8-celled; seeds minute, narrowly winged at the upper margin ... 5. DUABANGA.

Seeds imbedded in pulp, angular; berry 10–15-celled ... 6. SONNERATIA.

1. AMMANNIA, Linn.

Annual glabrous herbs growing in damp places; branches often quadrangular. *Leaves* opposite and alternate, sometimes whorled, entire; stipules 0. *Flowers* small, axillary, solitary and subsessile, or in small trichotomous cymes; bracteoles usually 2. *Calyx* campanulate or tubular-campanulate, 3–5-toothed, often with minute interposed teeth or folds. *Petals* 3–5 or 0, small, inserted between the calyx-teeth. *Stamens* 2–8, inserted on the calyx-tube. *Ovary* enclosed in the calyx-tube, 1–5-celled, the septa very thin and often absorbed; style filiform or short, stigma capitate; ovules numerous, placentas axile. *Capsule* membranous, globose or elongated-ellipsoid, enclosed in the calyx, 2–3-valved,

irregularly breaking up, or circumscissile. *Seeds* many, small, smooth, round on the back and with a raphe on the inner face, ellipsoid or nearly hemispheric; placenta ultimately free central by the absorption of the dissepiments covered by the seeds. DISTRIB. Species 30; in the tropical or warm temperate zones of the whole world.

Flowers sessile, calyx-tube elongate-campanulate, capsule ellipsoid, seeds narrowly oblong, falcate ... ... 1. *A. peploides.*
Flowers pedicelled, calyx-tube depressed-hemispheric, capsule depressed-globose, seeds sub-hemispheric ... ... 2. *A. baccifera.*

1. AMMANIA PEPLOIDES, Spreng. Syst. I, 444. *Flowers* in short axillary branches, sessile, solitary in the axils of reduced leaves; bracts in pairs, filiform, shorter than the tube of the calyx. *Calyx-tube* elongate-campanulate, almost smooth, its mouth with 4 acutely triangular teeth. *Petals* absent, or 4 and minute. *Capsule* 2-valved, ellipsoid; *seeds* narrowly oblong, sub-falcate, pink, angular, the hilum obscure. *Leaves* opposite, their midribs prominent; those of the flower-bearing branches linear-oblong, bearing a flower in the axil of each; those of the main stem elliptic or obovate, narrowed to the base and almost petiolate. *Stems* decumbent, often rooting, sometimes erect. Boiss. Flor. Orient. II, 742; Kurz in Journ. As. Soc. 1877, pt. II, 84; Clarke in Hook. fil. Flor. Br. Ind. II, 566. *A. nana*, Roxb. Flor. Ind. I, 427, (not of Wallich). *A. repens*, Rottl., DC. Prodr. III, 80. *Ameletia indica*, DC. in Mem. Soc. Hist. Nat. Genev. III, 11 (1825) 2, and 82, t. 3 f. A.; Prodr. III, 76; Wall. Cat. 2093; W. & A. Prodr. 303; Blume Mus. Bot. II, 135, t. 47; Dalz. & Gibs. Bomb. Flor. 96; Wight Ic. t. 257. *A. elongata*, Blume Mus. Bot. II, 135. *A. acutidens*, Miq. Flor. Ind. Bat. I, Pt. I, 617. *A. polystachya*, Wall. Cat. 2094. *A. latifolia*, Wall. Cat. 2096, (partly *Peplis indica*,) Willd. Sp. Pl. II, 244.

SOUTH ANDAMAN; near the settlements of Port Blair and Port Mowat; doubtless introduced as a weed of cultivation. DISTRIB. India, China, Persia; in rice and other fields.

2. AMMANNIA BACCIFERA, Linn. Sp. Pl. 120. *Flowers* in very condensed axillary racemes or clusters shorter than the leaves; bracts filiform, shorter than the flower-pedicels. *Calyx-tube* widely campanulate, short, ridged; the teeth 4, broadly triangular, acute. *Petals* none or minute. *Capsule* depressed-globose, imperfectly circumscissile above the middle. *Seeds* sub-hemispheric, black, excavated on the plane face. *Leaves* opposite, rather distant, linear-oblong, sub-acute or obtuse, narrowed at the base, smaller upwards, 2–5 in. long. *Stem* erect, glabrous, 8–24 in. long. Blume Mus. Bot. Lugd. Bat. II, 133; Dalz. & Gibs. Bomb. Flor. 97; Kurz in Journ. As. Soc. 1877, Pt. II, 85; Clarke in Hook. fil. Flor. Br. Ind. II, 569. *A. vesicatoria*, Roxb. Hort. Beng. 11

Flor. Ind. I, 426; ed. Wall. I, 447; DC. Prodr. III, 78; W. & A. Prodr. 305; Wall. Cat. 2098, (partly). *A. indica*, Lamk. Ill. I, 311, No. 1555; DC. l. c. 77; W. & A. Prodr. 305; Wall. Cat. 2099; Blume l. c. t. 46. *A. debilis*, Ait. Hort. Kew, ed. 1, I, 163. *A. verticillata*, Boiss. Flor. Orient. II, 743, (not of Link). *Hapalocarpum vesicatorium* and *H. indicum*, Miq. Flor. Ind. Bat. I, Pt. I, 618. *Cryptotheca apetala*, Blume Bijd. 1128; DC. l. c. 76.

PERAK; *King's Collector* 303; *Curtis* 3195. S. Andaman, in similar situations with the last.

2. PEMPHIS, Forst.

A maritime shrub or tree, 25–35 ft. high. *Leaves* opposite, oblong to oblong-lanceolate, entire, very thick, fleshy. *Flowers* small, axillary, solitary, peduncles 2-bracteate at their base. *Calyx-tube* campanulate, 12-∞-ribbed; teeth 6, short, with 6 shorter accessory teeth. *Petals* 6; inserted at the mouth of the calyx-tube and nearly as long, obovate, wrinkled, white or rose. *Stamens* 12, inserted in two series towards the middle of the calyx-tube. *Ovary* free at the bottom of the calyx-tube, 3-celled at the base; style long, stigma capitate; ovules many, ascending; placentas 3, sub-basal. *Capsule* coriaceous, obovoid or nearly globose, included in the calyx-tube or exserted nearly half its length, somewhat irregularly circumscissile, ultimately 1-celled. *Seeds* very many, long cuneate-obovoid, angular, smooth, standing out in all directions from the apparently free central placenta.

PEMPIS ACIDULA, Forst. Gen. t. 34. Young parts more or less clothed with grey silky hairs, the young branches 4-angled. *Leaves* subsessile or very shortly petioled, sub-acute or obtuse, ·5–1·5 in. long. *Flowers* white. *Capsule* ·4 in. long and ·2 in. in diam. DC. Prodr. III, 89; Wall. Cat. 2108; W. and A. Prodr. 307; Griff. Notul. IV, 510; Blume Mus. Bot. II, t. 43; Miq. Flor. Ind. Bat. I, pt. I, 619; Bedd. Flor. Sylv. Anal. Gen. t. XIV, fig. 5; Kurz For. Flor. I, 518. *P. angustifolia*, Roxb. Hort. Beng. 91; Flor. Ind. II, 465. *P. setosa*, Lour. Flor. Filip. ed I, 410. *Maclellandia Griffithiana*, Wight Ic. t. 1996. *Lythrum Pemphis*, Linn. f. Suppl. 249; Lamk. Ill. II, 408, fig. 2. *Melanium fruticosum*, Spreng. Syst. II, 445.

On the beech in SINGAPORE and probably in all the provinces. ANDAMAN and GREAT COCO ISLANDS; *Prain*. DISTRIB. Burma, Ceylon, S. of British India.

3. CRYPTERONIA, Blume.

Trees. *Leaves* opposite, petioled, entire, ovate or lanceolate. *Racemes* elongate, in branched panicles. *Flowers* minute, white or green,

with short linear bracts at the base of the pedicels, polygamo-dicœcious. *Calyx-tube* short, saucer-shaped, or longer and subhemispheric; teeth 5 (rarely 4), valvate, persistent. *Petals* 0. *Stamens* as many as the calyx-teeth, inserted between them near the mouth of the calyx-tube. *Ovary* free, 2-celled, with numerous horizontal or ascending ovules attached to the axile placentas; style long, filiform; stigma capitate, obscurely 2-lobed. *Capsule* surrounded at the base by the calyx, globose, pubescent, crowned by the persistent style, 2-celled, dehiscing so as to divide the style, fruit-pedicel deflexed. *Seeds* many, elongate-ellipsoid, narrowly winged on one side. DISTRIB. Species 5, extending from the Khasia Hills to the Philippine Islands.

Leaves membranous, usually narrowed to the base, nerves 5 or 6 pairs, calyx less than ·1 in. in diam. ... ... 1. *C. paniculata.*
Leaves coriaceous, rounded or cordate at the base, nerves 7 or 8 pairs, calyx more than ·1 in. in diam. ... ... 2. *C. Griffithii.*

1. CRYPTERONIA PANICULATA, Blume Bijdr. 1151. A tree 20–40 feet high; young branches glabrous or sometimes puberulous. *Leaves* membranous, oblong to oblong-lanceolate or more or less broadly elliptic, bluntly acuminate or blunt, narrowed to the base, entire, glabrous on both surfaces or slightly pubescent on the lower; main nerves 5 or 6 pairs, rather faint, curved; length 3–6 in., breadth 1·25–2·5 in. *Flowers* on short pedicels, very numerous, in long cylindric pubescent or glabrous racemes longer than the leaves, the racemes often panicled. *Calyx* less than ·1 in. in diam., its teeth triangular or triangular-lanceolate, acute. *Stamens* in the hermaphrodite flowers of the same length as the calyx-teeth, longer in the male flowers. *Capsules* globose-conic, puberulous or minutely velvety. Kurz in Journ. As. Soc. Beng. 187, Pt. II, 86; For. Flora Burma, I, 519. *C. pubescens*, Blume Mus. Bot. Lugd. Bat. II, 123; Clarke in Hook. fil. Flor. Br. Ind. II, 574; Griff. Notul. IV, 404; Ic. Pl. Asiat. t. 564, fig. II. *C. glabra*, Blume Mus. Bot. II, 123; Clarke in Hook. fil. Flor. Br. Ind. II, 574. *Henslovia pubescens*, Wall. Cat. 4904; Pl. As. Rar. III, 14 t. 221; Miq. Flor. Ind. Bat. I, Pt. I, 716; Planch. in Hook. Lond. Journ. Bot. IV, 477, t. XVI. *B. Henslovia Hookeri*, Wall. Cat. 8566. *H. affinis*, Planch. Lond. Journ. Bot. IV, 477 (*in part*). *H. leptostachys*, Planch. Lond. Journ. Bot. IV, 478. *H. glabra*, Wall. Cat. 4093; Pl. As. Rar. III, 14; Planch. in Hook. Lond. Journ. Bot. IV, 478; Miq. Flor. Ind. Bat. I, Pt. I, 716.

PENANG; *Porter*. MALACCA; *Maingay* (Kew Distrib. 650/2). PERAK; *King's Collector* No. 5205. ANDAMAN ISLANDS; very common; *King's Collector*. DISTRIB. Burma, Chittagong, Khasia.

I can find nothing better to distinguish the species which have been named

C. glabra and *C. pubescens* from each other than the presence on the latter of a small amount of hair, neither can I find any tangible character to separate either from *C. paniculata*, Blume. To the latter species, as the oldest, I therefore reduce both.

2. Crypteronia Griffithii, Clarke in Hook. fil. Flor. Br. Ind. II, 574. A tree 40–60 feet high; young branches glabrous. *Leaves* coriaceous, broadly elliptic, acute, very slightly narrowed to the rounded or cordate base, entire, glabrous on both surfaces; main nerves 7 or 8 pairs, distinct on the lower surface, curved, ascending; length 4–8 in., breadth 2·25–3·5 in. *Racemes* much longer than the leaves, rusty-pubescent, sometimes panicled; *flowers* numerous but not crowded, shortly pedicellate. *Calyx* rather more than ·1 in in diam., its teeth triangular. *Stamens* exserted. *Capsule* shorter than the calyx-teeth, velvety, less than ·1 in. in diam., crowned by the long stout pubescent style. *Hensloviæ* sp. Griff. Notul. 406; Ic. Pl. Asiat. t. 564, fig. 1.

Malacca; *Griffith* 2513. *Maingay* (Kew Distrib.) 651. *Derry* 1201. Penang; *Curtis* 1739. Perak; *Scortechini* 221. *Wray* 2589, 2638. *King's Collector* 3473, 4152, 8592.

4. Lagerstrœmia, Linn.

Trees or shrubs. *Leaves* opposite, distichous (or the uppermost alternate), entire, oblong or ovate. *Panicles* axillary and terminal, the ultimate branchlets usually cymose, sometimes dense; peduncles 2-bracteate at their apex; pedicels 2-bracteolate. *Flowers* often large. *Calyx-tube* funnel-shaped, smooth, grooved, angular or sub-alate; lobes 5-sometimes 7–9, ovate, subacute, valvate. *Petals* 6, sometimes 7–9 (or 0), inserted at the summit of the calyx-tube, clawed, wrinkled; margin crisped, erose, or fimbriate. *Stamens* very many, inserted in several rows near the bottom of the calyx-tube; filaments long, exserted. *Ovary* sessile in the bottom of the calyx, 3–6-celled; style long, bent, stigma capitate; ovules numerous, ascending, placentas axile. *Capsule* more or less adnate to the calyx, ellipsoid, coriaceous, smooth, 3–6-celled, 3–6-valved. *Seeds* many (rarely few), elongate, flat, erect, winged from their summit. Distrib. Species 18, in South-east Asia extending to Australia.

Inflorescence and exterior of calyx stellately ferrugineous-tomentose ... ... 1. *L. floribunda.*

Inflorescence and outside of calyx minutely cinereous or whitish-velvety (the calyx sometimes rusty in *L. Flos-Reginæ*).

Leaves glaucous beneath; calyx 10-ribbed, the mouth with only 5 teeth ... ... 2. *L. hypoleuca.*

Leaves not glaucous beneath.

Calyx 8- or 9-ribbed, the teeth as many as the ribs and alternate with them; flowers 1·5 in. in diam.; leaves 2–3·25 in. long ... ... 3. *L. ovalifolia.*

Calyx 12–14-ribbed; the teeth half as many as the ribs, the ribs opposite the teeth broader; flowers 2–3 in. in diam.; leaves 3·5–8 in. long ... ... 4. *L. Flos-Reginæ.*

1. LAGERSTRŒMIA FLORIBUNDA, Jack in Mal. Misc. I, 38. A tree 15–30 feet high. *Leaves* ovate-oblong or elliptic-oblong, sub-acute, the base rounded, sub-sessile; main nerves 8–12 pairs, sub-horizontal or curving upwards; both surfaces minutely reticulate when dry, the upper glabrous and shining, the lower with deciduous stellate pale brown pubescence, or glabrous; length 5–7 in., breadth 2–2·75 in. *Panicle* much longer than the leaves, terminal, erect; the branches long, racemoid, the ultimate branchlets cymose, ascending, everywhere (as also the calyces,) covered with more or less deciduous wooly rusty pubescence. *Flowers* 1·5 in. in diam., on short pedicels. *Calyx* turbinate in bud, boldly 12-ridged, each alternate ridge passing into one of the 6 triangular calyx-teeth and often forming a mucro at its apex. *Petals* sub-orbicular, with wavy edges, rose-coloured changing to whitish. *Stamens* unequal, the outer rows the longest. *Capsule* ·5 in. long, elliptic, minutely cinereous-tomentose, half enveloped in the calyx, style persistent. DC. Prodr. III, 93; Wall. Cat. 2115; Miq. Flor. Ind. Bat. I, pt. I, 623 (*not Blume Mus. Bot. II, t. 41*); Griff. Notul. IV, 509; Kurz For. Flor. I, 522; Clarke in Hook. fil. Flor. Br. Ind. II, 577.

KEDAH; *Curtis* 2602. PENANG; *King.* TRANG; *King's Collector* 1407. MALACCA; *Maingay* (Kew Distrib.) 653/2. DISTRIB. Burma, Siam, China.

2. LAGERSTRŒMIA HYPOLEUCA, Kurz in Journ. As. Soc. Beng. for 1872 Pt. II, p. 30. A tree 60–70 feet high; all parts except the inflorescence glabrous. *Leaves* thickly membranous, oblong-lanceolate to elliptic or oblong-elliptic, shortly acuminate, the base rounded; main nerves 8–12 pairs, spreading, not prominent; both surfaces rather distinctly reticulate when dry, the upper shining, the lower glaucous; length 5–8 in., breadth 2–3 in., petiole ·3 in. long. *Panicles* minutely cinereous-velvety, longer than the leaves, terminal, few-branched, the branches with rather short cymose sub-horizontal branchlets. *Flowers* about 1·25 or 1·5 in. in diam., on jointed whitish unequal pedicels. *Calyx* turbinate in bud, minutely whitish-velvety, boldly 10-ribbed, the alternate ribs excurrent into the 5 triangular acute mucronate lobes of the mouth. *Petals* lilac, oblong, wavy, ·5 in. long. *Capsule* woody, oblong, mucronate, about ·65 in. long. For. Flor. Burm., I, 523; Clarke in Hook. fil. Flor. Br. Ind. II, 577.

Andaman Islands; *Kurz, Prain, King's Collectors.* Great Coco Island; *Prain.*

3. Lagerstrœmia ovalifolia, Teysm. et Binn. in Nat. Tijdsch. Ned. Ind. II. (1840) 306. A tree 50 or even 100 feet high. *Leaves* oblong, ovate or oblong-obovate, acute, slightly narrowed to the base; main nerves 4 or 5 pairs, curved, ascending, slightly prominent on the lower surface when dry; upper surface greenish with minute black dots when dry, glabrescent except sometimes the minutely pubescent nerves; the lower brown when dry, glabrescent; length 2–3·25 in., breadth 1·25–2 in., petiole ·25 in. *Panicle* terminal, puberulous, 3–8 in. long, few-flowered; the branches few, sub-horizontal, cymose, puberulous below; the pedicels minutely velvety, cinereous. *Flowers* 1·5 in. in diam., on jointed velvety pedicels. *Calyx* turbinate, minutely cinereous-velvety, with 8 or 9 bold winged ridges not passing into the calyx-teeth. *Calyx-teeth* 8 or 9, acutely triangular, the edges thickened and reflexed. *Petals* (with claw) ·75 in. long, orbicular, clawed, purple, their edges slightly undulate. *Capsule* elliptic-ovoid, blunt, minutely velvety, ·75 in. long, and ·6 in. in diam. Kriudk. Arch. III, 440; Pl. Nov. Hort. Bog. (ed. Vriese) 20. Blume Mus. Bot. Lugd. Bat. II, 127; Miq. Flor. Ind. Bat. I, Pt. I, 624; Koorders and Valeton, Bijdr. I, 193. *L. celebica*, Bl. l. c. 127. *L. hexaptera*, Miq. Flor. Ind. Bat. I, Pt. I, 623; Clarke in Hook. fil. Flor. Br. Ind. II, 577.

Malacca; *Maingay* (Kew Distrib. 653). Perak; *King's Collectors* 8701, 10025 & 10532. Pahang; *Ridley* 2640.

I can find no character to separate *L. hexaptera*, Miq. from the older species of Teysmann and Binnindik. Miquel's name is moreover an unhappy one, as the calyx-teeth are usually 9 and not 6.

4. Lagerstrœmia Flos-Reginæ, Retz (1789) Obs. V, 25. A tree 30–60 feet high, all parts except the inflorescence glabrous. *Leaves* oblong to elliptic-oblong, acute, narrowed (rarely obtuse) at the base, shortly petiolate; main nerves 10–13 pairs, curving upwards, slightly prominent beneath when dry; both surfaces minutely reticulate, glabrous, the upper shining, the lower dull and of a dark brown colour when dry, length 3·5–8 in., breadth 1·75–3 in., petiole ·25–·4 in. *Panicle* terminal, longer than the leaves, its ultimate branchlets cymose. *Flowers* from 2–3 in. in diam., on rather thick greyish unequal pedicels. *Calyx* turbinate, with 12–14 prominent stout ridges; those opposite the calyx-teeth broader, the mouth with 6–7 acute triangular spreading thick coriaceous teeth thickened at the edges. *Petals* sub-orbicular, clawed, corrugated and with undulate edges. *Stamens* all equal in length. *Capsule* oblong to sub-globose, minutely apiculate, ·8–1·25 in. long, and ·6–·75 in. in diam. Kurz in For. Flora Burm. I, 524; Clarke in

Hook. fil. Flor. Br. Ind. II, 577. *L. Munchhausia*, Lamk. Ency. III, 375 ; Ill. t. 473 fig. 2. *L. Reginæ*, Roxb. Pl. Corom. I, 46, t. 65 ; Hort. Beng. 38 ; Hook. fil. Flor. Br. Ind. II, 505 ; Blume Bijdr. 1127 ; DC. Prodr. III, 93 ; W. & A. Prodr. Flor. Penins. Ind. 308 ; Blume Mus. Bot. Lugd. Bat. II, 126 ; Miq. Flor. Ind. Bat. I, Pt. I, 623 and Suppl. 328. *L. speciosa*, Pers. (1807) Ench. II, 72 (not of DC.) ; Koehne in Engl. Bot. Jahrb. IV, 28 ; Koorders and Valeton, Bijdr. I, 190, (excl. from all where reduced the syn. *L. macrocarpa*, Wall.).

Malacca, Singapore. Perak. Distrib. Java, British India.

I have adopted Retz's name (published in 1789) for this plant, as it is pretty nearly certain what Retz's plant was. Koehne, Koorders and Valeton and others however adopt Persoon's name of *L. speciosa* on the ground that, although it dates from only 1807, it preserves the specific name of Linnæus (*Munchhausenia speciosa* 1770). But this procedure is rendered inadmissable when Linnæus's description of that plant is consulted, for he describes *M. speciosa* as *a shrub*, whereas this plant is a large tree ; moreover the rest of his description would apply to various other species of *Lagerstræmia ;* the identity of *M. speciosa*, *L.* is thus quite uncertain. *L. macrocarpa* of Wall. Cat. 2114, is a tree of about the size of *L. Flos-Reginæ* and resembles it in most respects, but differs (1) in having leaves of larger size (5–12 in. long) more or less broadly elliptic, never oblong or elliptic-oblong, the apex often sub-acute and the base broad or narrowed into a petiole twice as long as that of *L. Flos-Reginæ ;* (2) in the calyx being very slightly, if at all, furrowed and never ribbed, and (3) in having a larger more globose capsule (1–1·35 in. long and nearly as much in diam.). This tree has been in cultivation in the Bot. Garden, Calcutta, side by side with *L. Flos-Reginæ* for many years. It flowers earlier than the latter, has pink (not lilac) petals, and much larger capsules. In my opinion it is a good species and should not be merged in *L. Flos-Reginæ*. It is found only in Burma and Chittagong. Kurz, who was familiar with it in its wild state in Burma, considered it distinct and kept it as a species in his Forest Flora of British Burma.

5. Duabanga, Ham.

Large glabrous trees with pendent quadrangular branches. *Leaves* opposite, distichous, large, short-petioled, elongated, acute, entire, cordate or rounded at the base. *Panicles* large, terminal, with opposite branches ; flowers large. *Calyx-tube* wide, adnate to the base of the ovary ; lobes 4–7, thick, valvate in the bud. *Petals* 4–7, clawed, obovate, crisped and undulate, white. *Stamens* very many, inserted on a perigynous ring. *Ovary* conical, 4–8-celled ; style bent, long ; stigma capitate, 4–8-lobed ; ovules very many, ascending, placentas covering nearly the whole interior surface of the ovarian cells. *Capsule* sub-globose, surrounded at the base by the thick spreading calyx, coriaceous, perfectly or imperfectly 4–8-celled, 4–8-valved. *Seeds* very numerous, minute, ellipsoid, testa produced at both ends in two tails much exceeding the length of the nucleus. Distrib. Species 2 ; Eastern Himalaya, Assam and Malaya.

Duabanga sonneratioides, Ham. in Trans. Linn. Soc. XVII, 178. A tree 60–100 feet high. *Leaves* thinly coriaceous, oblong to ovate-oblong, 7–12 in. long and 2·5–4 in. broad, glabrous, glaucous beneath. *Flowers* 2–2·5 in. across, on thick-jointed pedicels tapering to the base; panicle short, few-flowered, drooping. *Petals* 4–7, about 1 in. long. *Capsule* ovoid-globose, 1–1·5 in. in diam. Hook. fil. Ill. Him. Pl. t. 11; Kurz For. Flor. Burm. I, 525; Clarke in Hook. fil. Flor. Br. Ind. II, 579. *D. grandiflora*, Walp. Rep. II, 114. *Lagerstræmia grandiflora*, Roxb. Hort. Beng. 38; Flor. Ind. II, 503; DC. Prodr. III, 93; Wall. Cat. 2111; Blume Mus. Bot. I, 109. *Leptospartion grandiflorum*, Griff. Ic. Pl. Asiat. t. 591.

Perak; *Scortechini*, *King's Collector* 5912. Andamans and Nicobars, *King's Collectors*. Distrib. Burma, Assam, Khasia, Eastern Himalaya.

6. Sonneratia, Linn. f.

Ever-green trees, growing near the sea, glabrous. *Leaves* opposite, petioled, coriaceous, entire. *Flowers* without bracts, large, three together at the summits of the branches, or axillary and solitary. *Calyx* thick, coriaceous; lobes 4–8, lanceolate, valvate. *Petals* 0, or as many as the calyx-lobes and linear-oblong. *Stamens* numerous, inserted in a circular band on the calyx-tube. *Ovary* nearly free, or adnate at the base to the calyx-tube, many-celled; style long, stigma capitate; ovules numerous, ascending, placentas axile. *Berry* subglobose, supported by the persistent calyx, 10–15-celled. *Seeds* very many, small, curved, angular, embedded in pulp; cotyledons convolute. Distrib. Species 4–5; on the tropical sea-shores of the Eastern hemisphere.

With petals	...	...	...	...	...	1. *S. acida.*
Without petals :—						
Calyx in bud ovoid, obtuse	...	...	...	...	1.	*S. acida*, var. *Griffithii.*
Calyx in bud narrowly ellipsoid, tapering to both ends					...	2. *S. alba.*

1. Sonneratia acida, Linn. fil. Suppl. 252. A small tree 10–35 feet high, the branchlets jointed and 4-angled. *Leaves* oblong to oblong-obovate or obovate, tapering into a broad short petiole, blunt and sometimes retuse; length 2–3 in., breadth 1·35 to 2 in. in the obovate forms. *Flower-buds* solitary, ellipsoid, the calyx-tube not angled; the calyx when fully developed 1 in. long, its lobes 6–8, the lobes triangular, reflexed. *Petals* linear, slightly broader towards the apex than at the base. *Style* exserted, sometimes 3 in. long, stigma capitate. *Capsule* depressed-globose, sometimes as much as 2 in. in diam., the apex somewhat concave, the walls thick. Roxb. Hort. Beng. 38; Flor. Ind. II, 506; Roth Nov. Sp. 233; DC. Prodr. III, 231; Wall. Cat. 3641

W. & A. Prodr. 327; Wight Ic. t. 340; Griff. Notul. IV, 652; Blume Mus. Bot. I, 336; Miq. Flor. Ind. Bat. I, Pt. I, 496; Dalz. & Gibs. Bomb. Flor. 98; Brand. For. Flor. 242; Kurz For. Fl. Burm. I, 526; Clarke in Hook. fil. Flor. Br. Ind. II, 580; Koorders and Valeton, Bijdr. I, 198. *Rhizophora caseolaris*, Linn. Sp. Pl. 635. *Aubletia caseolaris*, Gærtn. Fruct. I, 479, t. 78.

Penang; *Curtis* 1108. Perak; *Scortechini*, *Wray* 2494. Andamans; *Kurz*, *Prain*, *King's Collectors*. Distrib. the coasts of Burma, the Deltas of the British Indian Rivers and of those of the Malayan Islands.

Var. Griffithii, *Leaves* obovate, petals none. *S. Griffithii*, Kurz Pegu Report, App. B. 54; For. Flora Burma, I, 526; Clarke in Flor. Br. Ind. II, 580. *S. alba*, Griff. (not of Smith) Notul. IV, 652. *S. neglecta*, Bl. Mus. Bot. Lugd. Bat. I, 338; Miq. Flor. Ind. Bat. I, Pt. I, 498.

Perak; *Scortechini* 967. Distrib. Burma.

The fruit of this variety is unknown; but the scanty material, so far as it goes, appears to show that the plant is merely an apetalous form of *S. acida* with leaves more obovate than is usual in that species. I have therefore reduced it to a form of the latter. Blume described other three species of *Sonneratia* with petals, *viz.*, *S. obovata*, *S. evenia*, and *S. lanceolata* separating them chiefly by characters taken from the shapes of the leaves. But in this genus the form of the leaf is very variable, and I doubt whether these three species are more than forms of *S. acida*. *S. Pagapat*, Blanco, and *S. ovalis*, Korth. are probably also forms of it.

2. Sonneratia alba, Smith in Rees Cyclop. XXXIII, No. 2. A small tree 10–15 feet high; young branches rather terete. *Leaves* obovate or obovate-reniform, decurrent on the short petiole, blunt or retuse, 2–4 in. long and nearly as broad, petiole ·125–·25 in. *Flower-buds* narrowly ellipsoid, tapering to each end, very slightly ridged; the fully developed calyx sharply angled; its lobes 6–8, oblong-lanceolate, acute. *Petals* none. *Flowers* about the size of those of *S. acida*, usually 2 or 3 together. *Capsule* broadly obconic, ribbed, 1 in. or more in diam. at the apex. DC. Prodr. III, 231; Blume Mus. Bot. Lugd. Bat. I, 338; Miq. Flor. Ind. Bat. I, Pt. I, 497; Kurz For. Flora Burma I, 526; Clarke in Flor. Br. Ind. II, 580; Koorders and Valeton, Bijdr. I, 200. *S. Mossambicensis*, Klotsch in Peters Reis. Mossamb. Bot. t. 12. *S. acida*, Benth. (*not of Linn. fil.*) Flor. Austral. III, 301; Hiern in Oliv. Flor. Trop. Afric. II, 483; Wall. Cat. 3641 B.

Singapore; *Wallich*. Distrib. Java, Moluccas.

Order XLIX. ONAGRACEÆ.

Herbs, rarely undershrubs, sometimes aquatic. *Leaves* opposite or alternate, entire or toothed, undivided (in *Trapa* the submerged leaves pinnatipartite), exstipulate. *Flowers* hermaphrodite, mostly axillary and solitary, or spiked or racemed towards the ends of the branches,

sub-irregular. *Calyx-tube* wholly adnate to the ovary (half-adnate in *Trapa*), limb with 2–5 valvate lobes. *Petals* epigynous, alternate with the calyx-lobes, rarely 0. *Stamens* as many or twice as many as the petals, inserted with them. *Ovary* inferior (half-inferior in *Trapa*), 1–6-celled, most often 4-celled; style 1, cylindric or subulate, stigma capitate or nearly 2-lobed or 4-fid; ovules one or many in each cell, pendulous or half-ascending, placentas axile. *Fruit* various, dehiscent or indehiscent, membranous capsular or bony, 1- or several-celled, 1 or ∞-seeded. *Seeds* without albumen, or nearly so. Distrib. Species 300, spread throughout the world, most abundant in the North Temperate Zone.

Stamens twice as numerous as the calyx-lobes ...	... 1. Jussiæa.
Stamens equal in number to the calyx-lobes ...	... 2. Ludwigia.

1. Jussiæa, Linn.

Herbaceous or suffruticose, sub-aquatic. *Leaves* simple, alternate, usually entire. *Flowers* white or yellow, solitary, axillary; pedicel usually bibracteate at the apex. *Calyx-tube* narrow, only slightly produced above the ovary; its teeth 4–6, acute, persistent. *Petals* 4–6, epigynous. *Stamens* also epigynous, twice as numerous as the petals. *Ovary* inferior, 4–5-celled; style simple, usually very short, the stigma 4-or 5-lobed; ovules numerous, axile, in several vertical rows at the inner angle of each cell. *Capsule* narrow, cylindric or angled, 4- or 5-celled, 8–10-ribbed, dehiscing septicidally. *Seeds* very numerous, without coma. Distrib. Species 30, tropical, chiefly American.

Jussiæa suffruticosa, Linn. Sp. Pl. 555. Erect, branching, 1–4 feet high. *Leaves* lanceolate, ovate-lanceolate or almost linear, acute or acuminate, narrowed to the base, villous, pubescent or sub-glabrous, 2–3 in. long, and ·25–·75 in. broad, sessile or very shortly petioled. *Flowers* ·5–·75 in. in diam., on very short pedicels, the bracts small or foliaceous. *Petals* wholly yellow. *Capsule* linear, cylindric, 1–2 in. long, membranous, not woody, 8-ribbed, deciduously villous or pubescent. *Seeds* sub-hemispheric; the testa with a prominent raphe, shining, brown, not corky. DC. Prodr. III, 58; Wall. Cat. 6334; Miq. Flor. Ind. Bat. I, Pt. I, 628; Kurz in Journ. As. Soc. 1877, Pt. II, 90; Clarke in Flor. Br. Ind. II, 587. *J. exaltata*, Roxb. Hort. Beng. 33; Flor. Ind. II, 401. *J. villosa*, Lamk. Dict. III, 331; DC. Prodr. III, 57; Wall. Cat. 6333; W. & A. Prodr. 336; Gibs. & Dalz. Bomb. Flor. 98. *J. fruticosa*, DC. l. c. *J. scabra*, Willd.; DC. l. c. *J. Burmanni, and octophila*, DC. l. c. *J. longipes*, Griff. Notul. IV, 689. *J. decumbens*, Wall. Cat. 6322. *J. angustifolia*, Lamk. Dict. III, 331 and Ill. t. 280, fig. 3; DC. Prodr. III, 55; Miq. Flor. Ind. Bat. I, Pt. I, 627. *Epilobium fruticosum*, Lour. Flor. Cochin-china 226. Rheede Hort. Mal. II, t. 50.

Singapore; Penang; Perak; Andaman Islands, and probably in all the other provinces; Distrib. British India, Ceylon.

A widely distributed plant to which many names have been given. It is readily distinguished from *J. repens*, Linn. (the only other species common to the tropics of both worlds) by its narrower leaves, membranous capsule and erect habit.

2. Ludwigia, Linn.

Herbs. *Leaves* alternate, undivided, sub-entire. *Flowers* usually axillary, solitary, sessile or nearly so, peduncle 2-bracteate at its apex. *Calyx-tube* scarcely produced above the ovary, linear in the Indian species; teeth 3–5, acute, persistent. *Petals* 3–5 (or 0), epigynous, yellow. *Stamens* equal in number to the calyx-segments, epigynous. *Ovary* inferior, 4–5-celled; style simple, stigma capitate; ovules very many, attached in 2 or more vertical rows to the inner angle of each cell. *Capsule* linear or oblong (in the Indian species), 4–5-celled, opening by terminal pores or breaking up irregularly along the sides. *Seeds* numerous, obovoid, smooth, raphe obscure or prominent but not large, without coma. Distrib. Species 20, mostly in North America; extending from the cool temperate zone to the equator; chiefly inhabiting marshes.

Capsules inflated, seeds in several rows ... ... 1. *L. parviflora.*
Capsules filiform, not inflated; seeds in a single row in each cell ... ... 2. *L. prostrata.*

1. Ludwigia parviflora, Roxb. Hort. Beng. 11; Flor. Ind. I, 419. An erect glabrous herb 8–24 in. high. *Leaves* lanceolate, linear-lanceolate or linear-oblong, narrowed to each end, 1–3 in long, and ·25–·75 in. broad. *Flowers* on short pedicels, usually 4-fid. *Petals* small. *Capsule* inflated, obsoletely 4-angled, smooth, crowned for sometime by the persistent calyx-teeth, ·35–·5 in. long. *Seeds* in many rows in each cell. DC. Prodr. III, 59; Wight Ill. t. 101; W. & A. Prodr. 336; Dalz. & Gibs. Bomb. Flor. 99; Benth. Flor. Austral. III, 307; Boiss. Flor. Orient. II, 752; Kurz in Journ. As. Soc. 1877, Pt. II, 91; Clarke in Hook. fil. Flor. Br. Ind. II, 588. *L. lythroides*, Blume Bijd. 1134; DC. l. c. *D. jussiæoides*, Wall. Cat. 6335 (*not of Linn. and others*).

Perak; *Scortechini* 442; *Wray* 2720. Distrib. British India and Ceylon.

2. Ludwigia prostrata, Roxb. Hort. Beng. 11; Flor. Ind. I, 420. *Stem* prostrate, or decumbent at the base and then erect, 8–24 in. long, glabrous. *Leaves* lanceolate or linear-lanceolate, acute or acuminate, tapering to the base, 2–4 in. long and ·35–·75 in. broad. *Flowers* sometimes more than one in an axil, sessile, 4-fid. *Petals* lanceolate, longer than the calyx. *Capsule* 4-angled, thin, filiform, not at all inflated,

smooth, crowned by the linear calyx-teeth ; length ·5–1 in. diam. ·02 in. *Seeds* oval, in a single row in each cell. DC. Prodr. III, 59 ; Wight Ic. t. 762 ; Kurz in Journ. As. Soc. 1877, Pt. II, 91. Clarke in Flor. Br. Ind. II, 588. *L. diffusa*, Ham. in Trans. Linn. Soc. XIV, 301; Wall. Cat. 6336 ; DC. l. c. *L. fruticulosa*, Blume Bijd. 1133 ; DC. l. c. *Nematopyxis prostrata, pusilla, and fruticulosa*, Miq. Flor. Ind. Bat. I, Pt. I, 630.

Perak ; *Curtis* 3183. Singapore ; *King's Collector* 58. Andamans ; *King's Collector*. Distrib. Burma, Cachar, Sylhet, Assam, and the base of the Eastern Himalaya.

A species closely resembling *L. parviflora*, but readily distinguished by having very slender capsules, through the walls of which the seeds may be distinguished lying in single row in each cell; whereas in *L. parviflora* the seeds are in several rows in each cell and are undistinguishable on the outside of the thick walls of the short inflated capsules.

Order L. SAMYDACEÆ.

Trees or shrubs. *Leaves* alternate, often distichous, petioled, rarely subsessile, simple, entire or slightly crenate or serrate, often closely punctulate beneath ; stipules small, deciduous. *Flowers* regular, small, axillary, shortly pedicelled, densely fascicled or in long simple or panicled racemes. *Calyx* coriaceous, persistent; tube short, free, or longer and adnate to the ovary; limb 3–7-fid. *Petals* as many as the calyx-lobes (or 0), perigynous, imbricated. *Stamens* definite or indefinite, often with staminodes between or united in a tube with them. *Ovary* superior or half-superior, 1-celled ; style 1, capitate or 3-fid at the apex, or styles 2–5 ; ovules many or several, placentas 2–5 (usually 3), parietal. *Fruit* loculicidally 2–5- (usually 3-) valved, valves carrying the seeds on their mesial line. *Seeds* several (usually few, sometimes many), oblong or angular, albuminous, usually drilled. Distrib. Species 180, scattered through the tropical regions of the globe, rarely also in the subtropical.

Flowers without petals :—
- Flowers in axillary glomeruli, rarely solitary ... ... 1. Casearia.
- Flowers in long slender racemes or panicles ... ... 2. Osmelia.

Flowers with petals; flowers in axillary or terminal racemes or panicles ... ... 3. Homalium.

1. Casearia, Jacq.

Shrubs or small trees. *Leaves* alternate, distichous, petioled, undivided, entire or slightly serrate, often minutely punctate; stipules small, lateral, caducous. *Flowers* small, greenish-yellow, clustered in the axils (in the Indian species) ; pedicels short, jointed above their bases, surrounded by small scales. *Calyx* inferior, deeply 4–5-lobed ;

lobes imbricate, obtuse, persistent. *Petals* 0. *Stamens* double the number of the calyx-lobes or thereabout, united in a tube with staminodes alternating with the free portion of the filaments; staminal tube hypogynous, sometimes very short so that the filaments are nearly or quite free. *Ovary* free, ovoid, 1-celled, style simple, stigma capitate or 3-fid; ovules many, parietal. *Fruit* succulent, globose or ovoid, ellipsoid (when dry somewhat 3-angular or 6-ribbed), 3-rarely 2-valved. *Seeds* many, angular or obovoid, with a fleshy usually coloured aril; embryo straight. DISTRIB. Species 140, in the warmer parts of the whole globe, most plentiful in America.

Leaves pubescent on the lower surface, glabrescent on the upper :—		
Leaves narrowed or rounded, but never cordate or truncate, at the base; glomeruli few-flowered	1.	*C. Lobbiana.*
Leaves cordate or truncate at the base; glomeruli many-flowered	2.	*C. grewiæfolia.*
Leaves glabrous on both surfaces :—		
Fruit not exceeding 1 in. in length and usually much shorter :—		
Leaves broadly elliptic, shortly acuminate, thinly membranous; calyx-teeth 4	3.	*C. albicans.*
Leaves elliptic-oblong, thinly coriaceous or membranous, main nerves 10–12 pairs; stamens 10 ...	4.	*C. andamanica.*
Leaves elliptic-oblong to elliptic-lanceolate, main nerves 6–8 pairs; stamens 8	5.	*C. esculenta.*
Fruit large, fleshy, 1·5–2 in. long; leaves narrowly oblong; coriaceous.		
Flowers in glomeruli :—		
Leaves tapering slightly to base and apex; fruit apiculate	6.	*C. Kunstleri.*
Leaves acute at the apex, sub-acute at the base; fruit not apiculate	7.	*C. Clarkei.*
Flowers solitary or in fascicles of 2, axillary ...	8.	*C. macrocarpa.*

1. CASEARIA LOBBIANA, Turcz. in Bull. Soc. Nat. Mosc. (1858), XXXI, Pt. I, 463. A slender tree 15–20 feet high; young branches slender, densely tawny-pubescent. *Leaves* oblong or oblong-lanceolate, shortly acuminate, the base rounded or narrowed; upper surface glabrescent, the midrib and nerves pubescent; lower surface sparsely pubescent, densely so on the midrib and nerves; main nerves 8–10 pairs, curving upwards, length 2–5 in., breadth ·75–2·25 in.; petioles ·2–3 in., tomentose, slender. *Flowers* few together in the leaf-axils, on very short pedicels, glabrescent. *Calyx-teeth* triangular, acute, reflexed. *Staminodes* villous, rather shorter than the stamens. *Fruit* almost sessile and nearly globose, orange-yellow when ripe, ·5 in. long and ·4 in. in diam. Clarke in Hook. fil. Flor. Br. Ind. II, 594.

Singapore; *Lobb.* Perak; *King's Collector* 2377, 2631, 10731; *Wray;* 829, 2594 *Scortechini* (without number). Distrib. Tenasserim.

2. Casearia grewiæfolia, Vent. Choix. 48. A small tree; young branches 4-angled, densely rusty-tomentose. *Leaves* oblong, acute, not at all or very little narrowed to the cordate sub-truncate base, the edges entire or minutely crenulate; upper surface shining, almost glabrous, the lower surface pellucid-punctate when fresh, tomentose on the midrib and 10–14 pairs of little-curved ascending main nerves, otherwise sparsely pubescent; length 4·25–6 in., breadth 1·25–2·35 in., petiole ·2 in. *Glomeruli* many-flowered, chiefly from the axils of fallen leaves; the flower-pedicels slender, ·25 in. long, minutely pubescent, articulated at the base. *Flower-bud* ·15 in. long; sepals minutely adpressed-pubescent, adnate at the base to the short staminal column. *Stamens* 8, the glabrous filaments alternating with the 8 pubescent staminodes. *Ovary* pyramidal, hairy at its junction with the style. *Fruit* compressed-ellipsoid, nearly 1 in. long, glabrous, boldly ridged when dry. DC. Prodr. II, 51; Miq. Flor. Ind. Bat. I, Pt. I, 706; Clarke in Flor. Br. Ind. II, 594. *C. variabilis*, Blume Mus. Bot. Lugd. Bat. I, 252. *C. subcuneata*, Miq. Flor. Ind. Bat. I, Pt. I, 706. *C. cinerea*, Turcz. in Bull. Soc. Nat. Mosc. (1858), XXXI, Pt. I, 462.

Malacca; *Maingay* (Kew Distrib.) 659, 661. Perak; *Scortechini;* 2003. Distrib. Java, Bali, and other Islands of the Malay Archipelago.

3. Casearia albicans, Wall. Cat. 7197. A shrub 3 or 4 feet high; young branches slender, very pale, almost white when dry, glabrous. *Leaves* thinly membranous, pale brown when dry and much pellucid-punctate, more or less broadly elliptic, shortly acuminate; the base rounded or very slightly narrowed, the edges entire, both surfaces glabrous and finely reticulate when dry; main nerves 8 or 9 pairs, curved, ascending; length 4–7·5 in., breadth 2·25–4 in., petiole ·25 in. *Glomeruli* small, few-flowered, axillary; flower-buds obovoid, almost sessile, surrounded by numerous acute bracteoles. *Calyx-teeth* 4, broadly triangular, glabrous. *Fruit* broadly ovoid, compressed, acute, subglabrous, 1 in. long and ·65 in. in its broad diameter. "*Samydeæ*," Wall. Cat. 7432.

Penang; *Wallich.* Perak; *King's Collector* 3634.

The above description is drawn up from the two sheets of Wall. Cat. above quoted and of King's Collector 3634. One of Wallich's specimens 9197 has fruit in a pocket detached from the twig, the others have no fruit. The plant here named *C. albicans* is not, however, that described under the same name by Mr. C. B. Clarke in the Flora of British India. Mr. Clarke's plant is 660 of Maingay's Herbarium, and is referred by me (along with 660/2) to *C. macrocarpa*, Clarke.

4. Casearia andamanica, new species. A tree 20–40 feet high; young branches pale brown, glabrous. *Leaves* oblong-elliptic, acute,

slightly narrowed and somewhat oblique at the very base; both surfaces glabrous, minutely reticulate when dry; main nerves 10–12 pairs, spreading, curving upwards, slightly prominent beneath; length 6–9 in., breadth 2·75–3·5 in., petiole ·5–·75 in. *Glomeruli* axillary, large and many-flowered; buds sub-globular, glabrous; pedicels about ·25 in. long glabrous, the bracteoles minute. *Calyx-segments* ovate, glabrous; staminal tube wide, nearly glabrous, adherent below to the sepals; filaments 10, as long as the tube and as the alternating villous staminodes. *Ovary* elongate-pyramidal, 3-angled, stigma capitate; fruit unknown.

Andaman Islands; *King's Collectors.*

5. Casearia esculenta, Roxb. Flor. Ind. II, 422. A shrub or small tree as high as 20 or 30 feet; young branches pale, striate when dry, glabrous. *Leaves* thinly coriaceous, elliptic-oblong to elliptic-lanceolate, acute at the apex and acute or obliquely rounded at the base, the edges entire; both surfaces reticulate; main nerves 6–8 pairs, spreading, not prominent; length 3–7 in., breadth 1·5–2·25 in., petiole ·25 in. *Glomeruli* axillary, many-flowered; buds and pedicels glabrous, the latter ·2–·25 in. long; bracteoles very short, glabrous. *Calyx-teeth* 4, broadly ovate, concave. *Stamens* 8, alternating with the staminodes. *Ripe fruit* ellipsoid to globular-ovate, glabrous, dehiscing by 2 or 5 valves, length ·75 in. or more. Clarke in Flor. Br. Ind. II, 592. *C. lævigata*, Dalz. in Hook. Journ. Bot. IV, 107; Dalz. & Gibs. Bomb. Flor. 11. *C. Championii* and *C. Zeylanica*, Thwaites, Enum. Pl. Ceylon, 19. *C. varians*, Thwaites Enum. 19 (*in part*).

Singapore; *Lobb*, *Griffith*, *Maingay* (Kew Distrib.) 657.

Perak; *Ridley* 5218; *Scortechini* 804; *King's Collector* 4699, 7001.

A widely distributed species presenting a considerable amount of variation. Perak specimens have larger leaves than those from British India; but they appear to have smaller fruits; for Roxburgh describes the fruit of the plant, as it grows in the Northern Circars, as being as large as a nutmeg.

6. Casearia Kunstleri, King n. spec. A tree 30–80 feet high; young branches pale, glabrous. *Leaves* coriaceous, narrowly oblong, tapering slightly to each end, the edges entire; both surfaces glabrous and minutely reticulate; the upper shining, the lower rather dull; main nerves 7 or 8 pairs, ascending and only slightly curved, prominent on the lower surface; length 5–7 in., breadth 1·5–2 in.; petiole ·25 in, stout. *Glomeruli* mostly in the axils of fallen leaves, many-flowered; pedicels stout, glabrous ·35–·45 in. long; buds ·15 in. long, blunt. *Calyx* 5-cleft, the segments broadly ovate, obtuse, concave, minutely pubescent. *Stamens* 10, broad, sub-acute, the filaments broad, pointed, their edges pubescent. *Staminodes* elliptic, their apices acute and

pubescent. *Ovary* broadly ovate, 5-celled; the stigma capitate-discoid, almost sessile. *Fruit* bright yellow, broadly ovoid or obovoid, apiculate, tapering also to the base, glabrous, 1·5–2 in. long and ·75–1·35 in. diam., pulpy and smooth when ripe, boldly 3-angled when dry.

Perak; *Wray* 3752; *King's Collector* 3694, 6936, 7118.

This resembles both *C. macrocarpa* and *C. Clarkei* in several respects, but it has larger and more numerous flowers, and the fruit is broader, in proportion to its length, than is the case in either of these species. The leaves are less shining and reticulate than those of *C. macrocarpa*, but they closely resemble those of *C. Clarkei*.

7. Casearia Clarkei, King. A tree; young branches thick, glabrous, striate. *Leaves* coriaceous, narrowly oblong, acute at both base and apex, both surfaces glabrous, the upper shining; main nerves 5–7 pairs, slightly curved, ascending, prominent beneath; length 5–10 in., breadth 1·5–2·75 in., petiole ·25–·4 in. long. *Glomeruli* very condensed, axillary, many-flowered; pedicels ·25 in. long, glabrous like the buds. *Ripe fruit* ovoid, bright yellow, 2 in. long and 1·25 in. in diam. *C. albicans*, Clarke in Flor. Br. Ind. II, 593 (not of Wallich).

Malacca; *Maingay* (Kew Distrib.) 660. Singapore; *Ridley* 6334.

This species resembles *C. macrocarpa* Clarke, but has smaller fruit. Its leaves are moreover larger, less shining and less reticulate, and the glomeruli are much more numerously flowered.

8. Casearia macrocarpa, Clarke in Hook. fil. Flor. Br. Ind. II, 593. A small tree; young branches reddish, glabrous. *Leaves* narrowly lanceolate, acute or acuminate, the base narrowed, the edges entire; both surfaces glabrous, shining, minute, reticulate when dry; main nerves about 5 or 6 pairs, curved, ascending, length 4–6 in., breadth 1 to 1·5 in., petiole ·3-4 in. long. *Glomeruli* axillary, one-or few-flowered; pedicels about ·15 in. long, glabrous, the buds glabrous outside, reddish; calyx-teeth 5, oblong, blunt, minutely velvety inside. *Fruit* obovoid or ellipsoid, compressed, 1·5–1·75 in. long by ·65 in. broad; seeds obovoid, compressed.

Penang; *Maingay* 660/2; *Curtis* 229 and 960.

2. Osmelia, Thwaites.

Trees. *Leaves* alternate, petioled, ovate or oblong-lanceolate, entire or obscurely serrate, epunctate; stipules minute, deciduous. *Flowers* small, very nearly sessile, in long simple or panicled racemes. *Calyx* inferior, divided nearly to the base; lobes 4 or 5, rounded, imbricate. *Petals* 0. *Stamens* 8 or 10, half alternating with as many 2-lobed hairy scales and half inserted in the notches of those scales. *Ovary* superior, 1-celled; styles 3, short, with capitellate or bifid stigmas; ovules few;

placentas 3, parietal. *Capsule* subglobose, 3-valved. *Seeds* few, subglobose, with a red fleshy aril. Distrib. Species 6; Malaya, Philippines, Ceylon.

Osmelia Maingayi, King n. spec.. A dioecious tree 20–60 feet high; young branches slender, minutely tawny-tomentose. *Leaves* membranous, oblong or elliptic-oblong to elliptic, shortly acuminate, the base rounded or slightly narrowed, the edges entire or very obscurely crenate; the upper surface glabrous, the lower covered with minute yellowish pubescence especially on the nerves and midrib; main nerves 6–10 pairs, curved, spreading, interarching within the edge; length 4–6 in., breadth 1·75 to 3 in., petiole ·6–·75 in. *Male panicles* slender, terminal, several times as long as the leaves; flowers ·1 in. in diam. or less, on short pedicels bracteate at the base, in slightly distant small glomeruli. *Sepals* 4, membranous, imbricate, rotund, pubescent, concave. *Petals* 0. *Stamens* 8 in two rows, one row with longer filaments alternating with the row opposite the broad villous glands. *Panicles of female flowers* axillary, shorter than the leaves, slightly longer in fruit. *Calyx* as in the male, but the segments smaller. *Stamens* subequal, shorter than the calyx, the filaments very short, glands and ovary densely hairy; the latter sub-globular, tomentose, crowned by 3 short distant bifid glabrous stigmas, 1-celled; ovules 3, erect. *Capsule* ·5–·65 in. long, 3-ridged, dehiscing by 3 valves.

Malacca; *Maingay* (Kew Distrib.) 1448. Perak; *Scortechini* 158, 191, 623. *King's Collector* 741, 1240, 2339, 4259, 4096, 5667, 7660, 7045, 10017, 10981; *Wray* 3665. Pahang; *Ridley* 2654. Singapore; *King, Ridley* 3804, 1904.

This appears to be a very common tree in Perak; for there is large suite of specimens of it in the Calcutta Herbarium numbering about 150 sheets. The various gatherings vary somewhat as to the amount of pubescence and number of nerves on the leaves, as also in the length of the panicles; but I cannot make out more than one species. Maingay's specimen (Kew Distrib.) 1439 looks as if it might be different. There is only a single sheet of it at Calcutta, and no flower remains on its panicles. Beccari's Sumatra plant 928 may possibly belong to still another species. All the species have the *facies* of *Antidesma;* the capsular fruit when present however at once distinguishes them from that genus.

3. Homalium, Jacq.

Shrubs or trees. *Leaves* alternate, crenate or subentire, petioled or sessile, rarely punctulate. *Flowers* hairy, small, in slender axillary and sub-terminal simple or panicled racemes; bract at the base of the pedicel often prominent but caducous. *Calyx-tube* funnel-shaped or cylindric, adnate to the base of the ovary; lobes 5–10, narrow, persistent. *Petals* 5–10, inserted in the throat of the calyx, linear-oblong, persistent. *Disc*

tomentose. *Stamens* solitary or in fascicles of 2–7, opposite the petals, alternating with large glands. *Ovary* half-superior, 1-celled; styles 2–5, filiform, stigmas capitellate; ovules many or several; placentas parietal, extending only down the upper free portion of the ovary. *Capsule* half-superior, coriaceous, 2–5-valved at the apex. *Seeds* few, angular or oblong. Distrib.—Species 50, scattered over the hot regions of nearly the whole globe.

Flowers never more than ·35 in. in diam.:—	
Stamens 1 opposite each petal; leaves glabrous ...	1. *H. longifolium.*
Stamens 2 in front of each petal; calyx-tube funnel-shaped:—	
Leaves glabrous, glaucous beneath; flowers 6-merous	2. *H. Kunstleri.*
Leaves glabrous except on the midrib beneath, not glaucous; flowers 6- or 7-merous	3. *H. propinquum.*
Leaves sparsely pubescent on both surfaces, the midribs tomentose; flowers 10-merous ...	4. *H. Griffithianum.*
Stamens 4 in front of each petal; flowers 6-merous, calyx-tube cylindric, expanding very slightly at the mouth	5. *H. frutescens.*
Flowers ·6–·75 in. in diam.:—	
Stamens 4 in front of each petal; calyx-teeth 5, much smaller than the petals	6. *H. undulatum.*
Stamens 7–9 opposite or sub-opposite to each petal; calyx-teeth 7–9, larger than the petals and accrescent	7. *H. grandiflorum.*

1. Homalium longifolium, Benth. in Journ. Linn. Soc. IV, 35. A tree 30–60 feet high; young branches slender, lenticellate, almost glabrous. *Leaves* coriaceous, oblong or oblong-lanceolate, acute or shortly and bluntly acuminate, the base narrowed; the edges entire, sometimes slightly undulate; both surfaces quite glabrous, the lower darkest when dry; main nerves 7–9 pairs, spreading, curved, faint; length 3–4·5, in., breadth 1·5–1·75 in.; petiole ·3 in., stout. *Racemes* slender, axillary, solitary, rarely branched, 4–7 in. long, covered with minute white tomentum. *Flowers* ·15 in. across, almost sessile, in fascicles of 3 or 4, 6-fid. *Calyx-tube* narrow, its segments lanceolate like the petals but broader *Stamens* one opposite to each petal alternating with yellow-glands. *Fruit* unknown. Clarke in Flor. Br. Ind. II, 596. *Blackwellia macrostachya*, Turcz. in Bull. Soc. Imp. Mosc. 1863 (Vol. XXXVI), 610.

Penang; *Phillips*, *Curtis* 201. Malacca; *Maingay* (Kew Distrib.) 665; *Derry* 994. Perak; *King's Collector* 4444, 7855, 10230, 10763; *Scortechini* 487, 2036. Selangor; *Scortechini* 1910.

2. Homalium Kunstleri, n. spec. King. A tree 30–40 feet high; young branches glabrous, rather slender, smooth, glaucous. *Leaves*

coriaceous, oblong-elliptic, shortly acuminate, narrowed or rounded at the base, sometimes oblique; the edges remotely crenate, revolute when dry; both surfaces glabrous, the lower glaucous; main nerves 8 or 9 pairs, faint, curving upwards; length 4·5–7 in., breadth 2·25–2·75 in.; petiole ·2–·3 in., thick. *Racemes* solitary, axillary, slightly longer than the leaves, bearing rather distant glomeruli of 3 or 4 flowers each, the rachis densely and minutely tomentose. *Flowers* ·3 in. in diam., the pedicels about ·1 in. long. *Calyx-tube* short, widely funnel-shaped; teeth 6, oblanceolate, obtuse, spreading, minutely tomentose externally. *Petals* 6, broadly lanceolate, sub-acute, equal in length to the calyx-teeth, villous on the inner surface. *Stamens* 2 in front of each petal; the filaments glabrous rising from a small bulb. Ovary hairy. Styles 5, short, sub-erect.

Perak; *King's Collector* 4286, 7109.

3. Homalium propinquum, C. B. Clarke in Flor. Br. Ind. II, 597. A tree 60–80 or even 120 feet in height; young branches pale brown when dry, puberulous. *Leaves* coriaceous, elliptic to elliptic-obovate, obtuse, or shortly acuminate, more or less narrowed and sometimes slightly oblique at the base, the edges undulate- or undulate-crenate; both surfaces glabrous, the midrib alone sometimes puberulous beneath; main nerves 9–11 pairs, curved, spreading, prominent beneath when dry; length 4–7 in., breadth 2·25–3·5 in.; petiole ·25–·35 in. *Racemes* 4–12 in. long, clustered and sometimes panicled at the apices of the branches, covered with soft pale tomentum. *Flowers* ·2 in. in diam., 6 or 7-fid, in close clusters and on pedicels ·15 in. long. *Calyx-tube* funnel-shaped; its segments longer than the petals, subspathulate. *Stamens* twice as many as the petals, all bearing anthers. *Fruit* unknown. *H. longifolium*, (*in part*) Benth. in Journ. Linn. Soc. IV, 35. *Blackwellia propinqua*, Wall. Cat. 4898. *B. spiralis*, Wall. Cat. 4897A.

Penang; *Porter*, *Curtis* 1592. Perak; *King's Collector* 3748, 3935, 4883, 7936. Malacca; *Griffith*; *Maingay* (Kew Distrib.) 664.

4. Homalium Griffithianum, Kurz in Journ. As. Soc. Bengl. XL, Pt. II, (for 1877), 57. A tree 30–40 feet high, the young parts softly tawny-pubescent. *Leaves* membranous, obovate-oblong, shortly and bluntly apiculate, slightly narrowed to the rounded or minutely sub-cordate base, the edges subentire to coarsely crenate; both surfaces sparsely pubescent, tomentose or densely pubescent on the midrib and 7–9 pairs of spreading little curved not prominent main nerves; length 2·75–5 in., breadth 1·65–2·5 in.; petiole ·2–·4 in., pubescent. *Racemes* solitary, one and a half times as long as the leaves, softly tawny-tomentose; the glomeruli few-flowered, not crowded together. *Flowers* ·35 in. in diam., densely villous in all parts. *Calyx-tube* conical

expanding into a wide mouth ; the teeth 10, linear. *Petals* oblanceolate or spathulate, broader and longer than the sepals. *Stamens* 2 in front of each petal, glabrous. *Ovary* short, crowned by 5 short slightly spreading styles, glabrous towards the apex. *Fruit* unknown. Kurz For. Flora Burma, II, 531 ; Clarke in Flor. Br. Ind. II, 597. *H. fœtidum*, Benth. in Journ. Linn. Soc. IV, 37 (*in part*). *Blackwellia dasyantha*, Turcz. Bull. Soc. Imp. Mosc. Vol. XXXVI (1863), 610. *Blackwellia spec.*, Griff. Notulæ IV, 584.

Kedah ; *Curtis* 2506. Trang ; *King's Collector* 1393. Distrib. Tenasserim.

Kurz describes the calyx-lobes and petals as 6 each, and in that he is quite wrong ; for dissection of Griffith's specimen (which is the type of the species) shows 10 of each. Although the structure of the flowers is the same in the gatherings of this plant from Burma, Kedah and Trang, there is considerable difference as to the amount of hair on the leaves and also as to their edges. The Burmese specimens are rather obscurely crenate except when very young ; the Kedah plant has its adult leaves boldly crenate and minutely pubescent on the lower surface and glabrescent on the upper (except the midrib and main nerves) ; while the Trang specimens are glabrescent on both surfaces, with the exception of the nerves and midrib. The flowers of the Trang plant are moreover slightly larger than those either from Kedah or Tenasserim.

5. Homalium frutescens, King. A tree 20–30 feet high ; young branches slender, pale when dry, glabrous, striate. *Leaves* thinly coriaceous, elliptic-oblong to elliptic, shortly acuminate, tapering slightly to the base ; main nerves 7 or 8 pairs, curving upwards, prominent beneath ; both surfaces glabrous, minutely reticulate, the lower pale-brown and the upper olivaceous when dry ; length 3–5 in., breadth 1·75–2·25 (rarely 2·75 in.), petiole ·1 in. *Racemes* axillary, sometimes with 2 or 3 branches, about as long as the leaves or sometimes longer, the rachis puberulous ; the flowers numerous but not crowded, in pairs or solitary, about ·25 in. long, and ·1 in. or ·15 diam. at the mouth ; the pedicel under ·1 in. in length. *Calyx* narrowly cylindric-conic, boldly ridged ; teeth 6, lanceolate, acute, erect. *Petals* larger than the petals, oblong-lanceolate, pubescent on both surfaces but especially on the upper. *Stamens* 4 opposite each petal and slightly exceeding it in length, glabrous. *Ovary* hairy, elongate ; styles 5, as long as the stamens, cylindric, erect. *Fruit* unknown. *Blackwellia longiflora*, Miq. Flor. Ind. Bat. I, Pt. I, 715. *B. caryophyllacea*, Zoll. et Moritz. Syst. Verz. 33 ; Miq. Flor. Ind. Bat. l. c. 715 ; *Homalium caryophyllaceum*, Benth. in Journ. Linn. Soc. IV, 38. *Cordylanthus frutescens*, Blume Mus. Bot. Ludg. Bat. II, 27, fig. III. *Homalium cordylanthus*, Benth. in Journ. Linn. Soc. IV, 38.

Selangor ; *Ridley* 1902. Johore ; *Ridley* 4050, 4182. Perak ; *King's Collector*, 776, 777, 784, 5246, 7040, 10471, 10237, 10102, 10996.

The flower of this is excellently figured by Blume in his Mus. Bot. as quoted above. Flowers however of a slightly different shape are found in some specimens. In these the calyx-tube is funnel-shaped and less cylindric, and the petals are more spreading. These are associated usually with larger leaves, more broadly elliptic in shape; and at one time I was of opinion that they might belong to a different species. But the examination of nearly a hundred specimens of the two forms as collected in Perak has convinced that they are not specifically separable. Blume describes the plant as a shrub, but in Perak it is always a small tree. Miquel's *Homalium obovale* from Sumatra (Flor. Ind. Bat. Suppl. 334) comes very near this, and perhaps is not distinct.

6. Homalium undulatum, n. spec. King. A tree 40–60 feet high; young branches slender, pale-brown, minutely lenticellate. *Leaves* thinly coriaceous, elliptic, shortly and bluntly acuminate, slightly narrowed and sometimes unequal at the base, the edges undulate-crenate; both surfaces glabrous and minutely reticulate when dry, the upper shining, the lower dull; length 3–4 in., breadth 1·75–2 in., petiole ·2–·25 in. *Inflorescence* consisting of a terminal panicle twice as long as the leaves and of a few solitary racemes from the upper leaf-axils, many-flowered, the rachises covered by minute rather sparse pale tomentum. *Flowers* ·6 or ·7 in. in diam., lax; their pedicels slender, tomentose, ·4 in. long. *Calyx-tube* widely funnel-shaped, very slightly ridged, minutely tomentose; teeth 5, lanceolate, tomentose on both surfaces like the tube. *Petals* 5, much longer than the sepals, obovoid, blunt, clawed at the base, reticulate, tomentose. *Stamens* shorter than the sepals and much shorter than the petals, 4 in front of each petal, glabrous. *Ovary* hairy, crowned by 3 narrowly conical spreading hairy styles. *Fruit* unknown.

Perak; *King's Collector* 7064, 8184.

7. Homalium grandiflorum, Benth. in Journ. Linn. Soc. IV, 37. A tree 30–40 feet high; young branches rather stout, glabrous. *Leaves* coriaceous, elliptic to oblong, acute or shortly acuminate, narrowed near the petiole, the edges revolute and obscurely crenulate; both surfaces minutely reticulate when dry, and the upper very shining, the lower somewhat duller; main nerves 9–12 pairs, ascending, only slightly curved; length 3·5–6·5 in., breadth 1·75–3·25 in.; petiole ·2–·3 in., stout. *Inflorescence* consisting of terminal few-branched panicles and of solitary axillary racemes with tomentose rachises. *Flowers* numerous but not crowded, solitary, not in glomeruli, ·75 in. in diam.; the pedicels ·2 in. long, tomentose. *Calyx-tube* short, hemispheric; teeth 7–9, spathulate-oblong, spreading, enlarged often flowering. *Petals* lanceolate, shorter than the calyx-teeth; the glands alternating with the petals, large. *Stamens* 7–12 opposite each petal; the filaments subulate, sparsely pilose. *Ovary* free or nearly so, 6–7-ridged, tomentose, conical; styles

6 or 7, short, glabrous, erect. *Fruit* unknown. Clarke in Flor. Br. Ind. II, 598. *Pierrea dictyoneura*, Hance, in Trimen's Journ. Bot. for 1877, 339.

Malacca; *Griffith.* Perak; *Scortechini.* Singapore; *Ridley* 6527. Gulf of Siam; *Hance.* Distrib. Tenasserim.

An examination of flowers of his *Pierrea dictyoneura*, sent to me by the late Dr. Hance, proves that that plant is a species of *Homalium* with larger flowers and more stamens than usual.

Order LII. CUCURBITACEÆ.

Climbing herbs or shrubs; tendrils solitary, lateral, spiral, simple or divided. *Leaves* alternate, petioled, frequently cordate, simple, lobed or pedately divided. *Flowers* monœcious or dicœcious, yellow or white, racemed and solitary, less commonly panicled. *Calyx-tube* wholly adnate to the ovary; limb rotate, campanulate, or tubular; lobes 5 (rarely 3), imbricate. *Petals* 5, inserted on the calyx-limb, united in a tube, or nearly or quite free, sometimes fimbriated at the margin, valvate or involute in the bud. *Stamens* inserted at the mouth or about the middle or at the base of the calyx-tube, usually 3 (sometimes 5 or 2), anthers free or united into a tube, one usually 1-celled and the other two 2-celled, cells straight or flexuose or conduplicate, the connective sometimes crested or produced. *Ovary* inferior, usually 3-carpellary; style 1 with 3 stigmas, more rarely styles 2–3–4; placentas usually 3, vertical, in double lines, the edges of the carpellary leaves being often turned in so far that the ovary (even before fertilization) is spuriously 3-celled; ovules usually many, horizontal, rarely pendulous, sometimes few and pendulous from near the top of the ovary. *Fruit* generally berried or fleshy, indehiscent or dehiscing by valves or by a circumscissile lid, often 1-celled, the seeds being often packed in pulp or fibre. *Seeds* usually many, often compressed, horizontal, pendulous, frequently corrugated or sub-spinose on the margins, albumen 0. Distrib. Species 600, in the warmer parts of the whole globe especially in the tropics.

Tribe I. Cucumerineæ. Ovules horizontal; female flowers solitary, never panicled; stamens 3, rarely 2 or 5, free or variously connate; cells of anthers straight, curved or flexuous; ovary bearing 3 (rarely 2 or 5) placentas:—

Anther-cells conduplicate or sigmoid; corolla rotate or campanulate, divided to the base:—

Petals cirrhiferous or fimbriate:—

Seeds only 6, perfect, very large ... ... 1. Hodgsonia.

Seeds numerous, testa not fibrous ... ... 2. Trichosanthes.

Petals entire:—

Calyx-tube of male flower elongate; the anthers included in the tube, cohering, sessile or subsessile, tendrils usually simple ... ... 3. Gymnopetalum.

Calyx-tube of male flower short; anthers usually exserted or sub-exserted, free or slightly coherent :—
Stamens inserted near the mouth of the calyx-tube; the anthers cohering slightly :—
Male flowers in racemes or clusters; fruit more or less fibrous, dehiscing by a transverse lid near the apex; tendrils 2–5-fid ... 4. LUFFA.
Male and female flowers solitary; fruit not fibrous, very fleshy, indehiscent; tendrils 2-fid 5. BENINCASA.
Stamens inserted below the mouth of the calyx-tube; anthers more or less cohering; male flowers in racemes, usually bracteate; tendrils simple ... ... 6. MOMORDICA.
Anther-cells straight, the connective produced, the fruit on a slender pedicel ... ... 7. MELOTHRIA.
Tribe II. GYNOSTEMMEÆ. Ovules pendulous; female flowers in panicles; stamens 3–5, anther-cells straight, filaments connate near the base; ovary 3-celled and with 3 placentas, fruit indehiscent ... ... 8. GYNOSTEMMA.
Tribe III. ZANONEÆ. Ovules pendulous, female flowers in panicles or racemes; stamens 5, free, anthers straight; ovary with 3 placentas; fruit cylindric or clavate, dry, 1-celled, dehiscence circumscissile; seeds winged :—
Calyx-lobes 3, seeds winged all round ... ... 9. ZANONIA.
Calyx-lobes 5, seeds winged at the apex only ... 10. ALSOMITRA.

1. HODGSONIA, H. f. & T.

A large climber. *Leaves* coriaceous, 3–5-lobed, long-petioled; tendrils 2–3-fid. *Flowers* large, dicœcious; males in long racemes; bracts oblong, entire, deciduous; females solitary. *Male-calyx* long-tubular, with a shortly campanulate mouth and 5 short teeth; petals 5, connate at the base, very long-fimbriate; stamens 3, filaments very short; anthers exserted, connate, linear, one 1-celled, two 2-celled, cells conduplicate. *Female* calyx and corolla as in the male; ovary globose, 1-celled; style long; stigmas 3, oblong, bifid, exserted; placentas 3, parietal, near the base of the ovary, 2-ovulate on each side. *Fruit* large, depressed-globular, 12-grooved, flesh hard; perfect seeds usually six, each having a smaller, commonly barren one, attached to its side, flat-ellipsoid, with sunk veins.

HODGSONIA HETEROCLITA, Hook. fil. and Thoms. in Proc. Linn. Soc. II, 257. *Stem* very long, often reaching 80 or 100 feet. *Leaves* palmate, somewhat cordate at the base; the lobes entire, rarely slightly denticulate, acute; both surfaces glabrous, minutely reticulate when dry, 6–10 in. long and as broad, the petioles 2 or 3 in. long. *Male racemes* about as long as the leaves; bracts solitary, oblong, acute, ·5 in. long. *Calyx* rusty-tomentose externally, the tube 3 or 4 in. long, with a gland

on each tooth of the mouth. *Petals* sub-obcordate, retuse, about 2 in. long, covered with brown hairs and 3-nerved externally; the inner surface white, the margins fringed with very long spiral villous yellow threads. *Filaments* clavate, anthers forming an inverted cone; *pistil* 0. *Female* flowers often on a separate plant; their peduncles 1 or 2 in. long, occasionally in a raceme much shorter than those of the males; *stamens* 0. *Fruit* turbinate, 4–10 in. in diam., and less from base to apex, covered with short reddish-brown tomentum. *Seeds* 2–3 in. long, and 1·5–2·25 in. broad. Hook. fil. Ill. Himal. Pl. tt. 1, 2, 3; Flor. des Serres, t. 1262, 3; Clarke in Hook. fil. Flor. Br. Ind. II, 606. *Hodgsonia macrocarpa*, Cogn. in DC. Mon. Phan. III, 349. *Trichosanthes macrocarpa*, Bl. Bijdr. 935; Ser. in DC. Prodr. III, 315; Miq. Flor. Ind. Bat. I, Pt. II, 676. *T. hexasperma*, Bl. Bijdr. 935; DC. Prodr. III, 315; Hassk. Pl. Jav. Rar. 192; Miq. Fl. Ind. Bat. l. c. 678. *T. heteroclita*, Roxb. Hort. Beng. 70; Fl. Ind. III, 705; Wall. Cat. 6684. *T. grandiflora*, Wall. Cat. 6685 (not of Blume).

Perak; *Scortechini*, *Wray*, *King's Collector*. Malacca; *Maingay*. Penang; *Wallich*. Distrib. Sumatra, Java, Borneo, Burma, Assam, and the base of the Eastern Himalaya.

The earliest name of this species was Roxburgh's (*T. heteroclita*), published in the *Hortus Bengalensis* in 1814. Blume's name *T. macrocarpa* dates from 1826.

2. Trichosanthes, Linn.

Scandent herbs. *Leaves* entire or 3–9-lobed, denticulate; tendrils usually 2–5-fid. *Flowers* dicœcious or occasionally monœcious, white; male peduncles usually in axillary pairs, one 1-flowered caducous, the other racemose; bracts large or small or 0; female flower solitary. *Male-calyx* long-tubular; teeth 5, lanceolate, entire serrate or laciniate. *Corolla* 5-fid nearly to the base, lobes long-fimbriate; stamens 3; anthers almost included, connate (free in *T. dioica*), long-linear, one 1-celled, two 2-celled, cells conduplicate. *Female* calyx and corolla as in the male. *Ovary* inferior, at the base of the calyx-tube, 1-celled; style filiform, 3-or 6-fid at the apex; placentas 3, parietal; ovules very many, horizontal, half-pendulous. *Fruit* lanceolate or globose, smooth, acute or obtuse at the apex. *Seeds* many, horizontal, packed in pulp, compressed, ellipsoid, sometimes angular on the margin. Distrib. Species 38, in South-East Asia, extending through Malaya to North Australia, also through China to Japan.

Leaves, although often deeply lobed, always simple :—
- Male inflorescence ebracteate ... ... 1. *T. cucumerina*.
- Male inflorescence bracteate :—
  - Bracts linear-oblong or narrowly rhomboid, quite entire ... ... 2. *? T. Hearni*.

Bracts small ovate-lanceolate, caudate-acuminate, obscurely dentate, leaves quite smooth and glabrous on both surfaces ... ... 3. *T. tricuspidata.*

Bracts very large, ovate to sub-orbicular, deeply incised or simply serrate; calyx-teeth lanceolate; fruit usually globular, rarely ovate ... ... 4. *T. palmata.*

Bracts rather large, oblong-ovate, laciniate; calyx-teeth spreading, entire; fruit always ellipsoid ... 5. *T. Wallichiana.*

Leaves usually trifoliolate, but sometimes simple on the same or different plants; leaflets membranous, unequal, much acuminate, the edges undulate-dentate: bracts of male inflorescence small, oblong, their edges with a few long distant teeth ... ... 6. *T. Wawræi.*

Leaves always trifoliolate; leaflets coriaceous, shortly and bluntly apiculate or subacute, the edges quite entire; bracts of male inflorescence deltoid, their edges pectinate 7. *T. celebica.*

1. Trichosanthes cucumerina, Linn. Sp. Pl. Ed. 1, 1008. *Stems* slender, angled, puberulous. *Leaves* membranous, orbicular-reniform to broadly ovate in general outline; the edges remotely denticulate, often more or less deeply 3–5 or 7-lobed; the lobes broad with acute but not acuminate apices and often sinuate margins, the base deeply cordate, the sinus often sub-rectangular; upper surface sparsely pubescent or sub-glabrous, the lower deciduously pubescent at first, ultimately sub-scabrid; length 2–4 in. and breadth about the same; petiole 1–2 in., pubescent; tendrils slender, sulcate, puberulous, 2–3-fid. *Male peduncles* rather longer than the leaves, pubescent, bearing a few flowers towards the apex, ebracteate. *Flowers* ·5–1 in. in diam. at the mouth; the tube 2 or 3 times longer, cylindric, a solitary male flower sometimes from the same axil as the peduncle. *Female flower* on a peduncle ·5 in. long, fruit 1–3 in. long, narrowly ovoid, the apex conical, red when ripe; seeds half ellipsoid, compressed, corrugated. Lour. Flor. Cochchin, 588; Ser. in DC. Prodr. III, 315; Roxb. Hort. Beng. 70; Roxb. Flor. Ind. III, 720; Wall. Cat. 6690 A, B, C, D, F; Blume Bijd. 933; Dalz. & Gibs. Bomb. Flor. 102; Miq. Flor. Ind. Bat. I, Pt. I, 676; Naud. in Ann. Sc. Nat. Ser. 4, XVIII, 191; Kurz in Journ. As. Soc. 1877, Pt. II, 98; W. & A. Prodr. 350; Miq. Flor. Ind. Bat. I, Pt. I, 676; Thwaites Enum. Pl. Ceyl. 126; Benth. Flor. Austral. III, 314; Clarke in Hook. fil. Flor. Br. Ind. II, 609; Cogn. in DC. Mon. Phan. III, 358. *T. laciniosa*, Klein in Herb. Rottler. *T. pilosa*, Wall. Cat. 6691. *Bryonia umbellata*, Wall. Cat. 6700 D. *Cucumis Missionis*, Wall. Cat. 6728.

Perak; *King's Collector* 5622. Distrib. Malayan Archipelago; British India.

The Perak plant has larger flowers than any Indian specimen, and I refer it to *T. cucumerina* with some hesitation.

2. ? Trichosanthes Hearni, F. Mull. in Benth. Flor. Austral. III, 315. *Stem* slender, glabrous, sulcate. *Leaves* membranous, broadly ovate, the apex acute or acuminate, the base deeply and widely cordate; the edges rather remotely denticulate, sometimes remotely sinuate-lobed; the upper surface glabrous and shining, the lower densely and minutely pubescent, the nerves, subglabrous and stout; length 4–8 in., breadth 3·5–6 in., petiole 1–1·75 in. *Male peduncles* often in pairs, axillary, longer than the leaves, slender, puberulous, angled; floriferous in the upper half; bracts linear-oblong, entire, about ·25 in. long; several of the lower ones narrowly rhomboid, all pubescent, flowers under 1 in. in diam. at the mouth; calyx-tube cylindric, the mouth narrowly infundibuliform, puberulous; the lobes of the mouth narrow, acute. *Female flower* and fruit unknown.

Andamans; *Kurz, King's Collector.*

The late Mr. Kurz collected a single specimen of this on Rutland island (in the Andaman group) many years ago, and he referred it in the Calcutta Herbarium to *Trichosanthes reniformis*, Miq. He also suggested for it the name *Trichosanthes herpetospermum*,—a name which he never published. In 1890 several specimens of the plant were collected near Port Mowat, on the South Andaman. Specimens of this second gathering, as well as of Kurz's original gathering, were sent by me to Mr. C. B. Clarke who found that they closely resemble, and are probably identical with, *T. Hearni*, an Australian species named by the late Baron von Müller, and of which an imperfect description was published by Mr. Bentham in his Flora of Australia. And to this species I now doubtfully refer both the Andaman gatherings.

3. Trichosanthes tricuspidata, Lour. Flor. Cochinchin. II, 723. *Stem* stout, sulcate, smooth, glabrous. *Leaves* thinly coriaceous, ovate-sub-triangular, with from 3–5 stout triangular broad, acute or acuminate, spreading lobes, the base broadly cordate, the edges remotely and minutely denticulate or subentire, glabrous on both surfaces; length and breadth 3–5 in.; petiole slender, 1–1·5 in.; tendrils 3-fid. *Male peduncles* floriferous for half their length, longer than the leaves, stout, glabrous or puberulous, 10–20 flowered; bracts thick, rigid, ovate-lanceolate, caudate-acuminate, obscurely dentate or entire; calyx-tube tapering to the base, shortly but densely tomentose, the lobes caudate-lanceolate with a few irregular distant teeth; corolla 1·5 in. in diam. *Female flower* from the same axil as the male peduncle, the tube 1·5 in. long, the corolla ·75 in. in diam.; *fruit* ovoid when young, subglobular and 2 in. in diam. when ripe, smooth, yellow with numerous small black pustules, the pulp thick; the seeds in the very centre, broadly ovate, compressed, ·5 in. long and ·4 in. broad. Blume Bijdr. 935; Ser. in DC. Prodr. III, 315; Roem. Syn., fasc. II, 95; Miq. Flor. Ind. Bat. I, Pt. I, 676; Cogniaux in DC. Mon. Phan. III, 374.

Penang; *Curtis* 1947. Perak; *Scortechini* 376; *King's Collector* 2202, 5111; *Wray* 4029.

This resembles *T. palmata*, Roxb. and *T. Wallichiana*, Wight; but the lobes of the leaves are shallower and their surfaces more glabrous and not at all scabrid, while the bracts of the male inflorescence are much narrower and very acuminate; and their edges, instead of being laciniate, are entire or at most obscurely dentate.

4. TRICHOSANTHES PALMATA, Roxb. Hort. Beng. (1814) p. 70. *Stem* stout, angled and sulcate, glabrous. *Leaves* thickly membranous, broadly ovate or orbicular in general outline, deeply cut down to about the middle into 3–7 lobes; the lobes acute or acuminate, their edges entire or denticulate, the base deeply but usually narrowly cordate; upper surface more or less scabrous or scabrid, glabrous, glandular near the apex of the petiole, the lower glabrous or somewhat pubescent, length and breadth 2–6 in.; petiole rather slender, 1 to 3 in. long; tendrils 2- or 3-fid. *Male* racemes sometimes in pairs, longer than the leaves, few-flowered; bracts large, ovate to sub-orbicular, deeply incised or simply serrate, glabrous or with viscid hairs; calyx-tube 1·5 in. long, tomentose or glabrous, the teeth lanceolate, the edges deeply serrate or laciniate. *Female* flower solitary, on a peduncle less than 1 in. long; fruit ovoid, pointed when young, globular when ripe, 1·5–2 in. in diam. *T. palmata*, Roxb. Flor. Ind. III, 704; Wall. Cat. 6688 (excl. C, F); W. & A. Prodr. 350; Wight Ill. t. 104, 105; Dalz. & Gibs. Bomb. Flor. 103. *T. laciniosa*, Wall. Cat. 6689 A, B. *T. aspera*, Heyne in Herb. Rottler. *T. tricuspis*, Miq. Flor. Ind. Bat. I, Pt. I, 679. *T. cordata*, Wall. Cat. 6686 (excl. A and B). *T. anguina*, Wall. Cat. 6687 (F partly); Voigt Hort. Bot. Sub. 58. *T. bracteata*, Kurz in Journ. As. Soc. Beng. 1877, Pt. II, 99; Cogn. in DC. Mon. Phan. III, 375. *T. pubera*, Blume Bijdr. 936; Ser. in DC. Prodr. III, 315; Roem. Syn. fasc. II, 95; Miq. Flor. Ind. Bat. I, Pt. I, 675. *Cucurbita Melopepo*, Wall. Cat. 6725. *Involucraria Wallichii*, Seringe in DC. Prodr. III, 318. *Bryonia palmata*, Wall. Cat. 6711 F.

PERAK; *Wray* 2181, 2371, 2478, 3049; *King's Collector* 1848, 4983, 10579. ANDAMANS; *King's Collector*.

The fruit when ripe is usually globular; but there are specimens in the Calcutta Herbarium which have oval fruit like *T. Wallichiana*, Wight, and at the same time the scabrid leaves and laciniate calyx lobes which are supposed to be characteristic of this species.

5. TRICHOSANTHES WALLICHIANA, Wight in Ann. and Mag. Nat. Hist. VIII, 70. *Stem* robust, angled and sulcate, glabrous. *Leaves* membranous, sub-orbicular in general outline, divided half-way down or more into 3–5 oblong or triangular acute lobes; the lobes sparsely denticulate, the lower on each side sometimes lobulate, the base deeply and widely cordate; both surfaces glabrous and usually smooth, the upper sometimes slightly scabrid and with a few glands near the apex of the petiole; length and breadth 3–7 inches, tendrils 3-fid. *Male*

peduncles at first shorter than the leaves, elongating with age; bracts oblong-ovate, their edges laciniate; calyx-tube glabrous, the teeth spreading, entire; petals obovate, laciniate. *Female flower* solitary; fruit ellipsoid, obtuse, smooth, 2–4 in. long. Cogn. in DC. Mon. Phan. III, 368. *Involucraria Wallichiana*, Ser. in Mem. Hist. Nat. Geneve III, Pt. I, 25 t. 5; in DC. Prodr. III, 318; Roem. Syn. fasc. 2, p. 98. *Trichosanthes multiloba*, Clarke in Hook. fil. Flor. Br. Ind. II, 607 (not of Miq.). *T. grandibracteata*, Kurz in Journ. As. Soc. Beng. XLVI, 98, 99.

Pahang; *Ridley* 244. Singapore; *Ridley* 296, 446, 4762. Penang; *Curtis* 2004. Perak; *Scortechini* 508 and 600.

A species scarcely separable from *T. pubera*, Bl., of which in my opinion it would better be treated as a variety.

6. Trichosanthes Wawræi, Cogn. in DC. Mon. Phan. III, 384. *Stem* slender, sub-glabrous, sulcate. *Leaves* membranous, trifoliolate or simple; leaflets of the trifoliolate form unequal, the middle one oblanceolate, the lateral ones angularly auriculate or lobulate at the base on the outer side, the edges of all subentire or sparsely denticulate and the apices much acuminate, all with slender petiolules ·25–·3 in. long; the lower surface reticulate when dry, glabrous, the upper sparsely and minutely pustulate and glabrous; length of the leaflets 2·5–5 in., breadth ·75–1·5 in., petiole 1·25–2 in.; the simple form triangular-oblong, tapering gradually to the apex, the base with 2 short sub-horizontal lobules, length 2·5–5 in.; tendrils short, simple or bifid. *Male peduncles* shorter than the leaves, very stout, sulcate, glabrous, many-flowered; bracts small, oblong, their edges with a few long teeth, the flowers extending for half their length; calyx ·5 in. long, narrowly campanulate, suddenly contracted into the tube, the teeth erecto-patent or recurved, lanceolate, acuminate, entire. *Female flower* with cylindric tube slightly dilated at the apex, the teeth as in the male; petals white, yellowish at the base, oblong, 3-nerved, the fimbriæ long, the external surface minutely papillose; ovary, glabrous, ovoid-oblong; *fruit* subglobular when young, oblong when ripe, smooth, red with orange or white stripes; *seeds* compressed, oblong-ovoid, ·6 in. long.

Perak; *King's Collector* 2203, 4519, 4668, 5380, 5405, 10176. *Wray* 2382; *Scortechini*. (Singapore; *Wawra* 241 in Herb. Vindob. *fide* Cogniaux.)

Cogniaux describes this as having its leaves always trifoliolate. But in some of the Perak specimens both trifoliolate and simple leaves as above described are to be found; in a few only simple leaves, and in the majority only trifoliolate.

7. Trichosanthes Celebica, Cogn. in DC. Mon. Phan. III, 385. *Stem* slender, glabrous, sulcate, sometimes hairy at the nodes. *Leaves* coriaceous, trifoliolate; the leaflets unequal in size, the middle one

the largest, ovate-oblong, shortly acuminate or sub-acute; the base slightly narrowed, oblique, not cordate, the edges quite entire; both surfaces glabrous, minutely reticulate when dry, the upper minutely punctate; length of leaflets 3–4·5 in., breadth 1·5–2·5 in.; petiole 1–1·5 in. long, stout; petiolules ·15 in.; tendrils short, bifid. *Male peduncle* shorter than or equal to the leaves, stout, deeply sulcate, adpressed-pubescent, floriferous for half its length; bracts deltoid, pectinate, tawny glandular-tomentose. *Calyx-tube* narrowly infundibuliform, minutely pubescent; the teeth lanceolate, acuminate, entire, erecto-patent. *Female flower* unknown. *Fruit* ovate, smooth, 8 in. long and 3 or 4 in. in diam. with a leathery rind, bright red with 10 yellow stripes when ripe; *seeds* obliquely oblong, compressed, smooth, ·6 in. long and ·4 in. broad.

Perak; *Wray* 2460; *Scortechini*; *King's Collector* 4033. Singapore; *Ridley* 2051, 4592, 6783; *Hullett* 247. Distrib. Celebes, Beccari.

3. Gymnopetalum, Arn.

Twining herbs, tendrils usually simple or 2-fid. *Leaves* petioled, 5-angular, nearly entire or deeply lobed. *Flowers* white (or yellow ?), somewhat large; occasionally monœcious; male peduncles in fully developed plants 2 from each axil, the earlier 1-flowered, the later longer with racemes, either often suppressed; bracts on the racemes persistent, large, lanceolate, incised or small; females 1-flowered, usually in separate axils. *Male* calyx-tube long, contracted near the mouth, limb of 5 lanceolate segments; petals 5, not fimbriate on the margin; stamens 3; anthers included, connate, elongate, 1–2-celled, cells conduplicate; rudiments of the ovary 1 or 3, small, linear. *Female* calyx and corolla as in the male; ovary oblong; style long, stigmas 3, short linear; ovules horizontal, many; placentas 3, long, vertical. *Fruit* ovate-oblong, acute at both ends. *Seeds* many or few, ellipsoid, compressed, margined, nearly smooth. Distrib. Species 6; in India, China and Malaya.

Leaves not lobed	1. *G. integrifolium.*
Leaves lobed :—	
Leaves 3–5-lobed half way down, reniform to triangular in general outline; lobes triangular acute, not lobulate	2. *G. Cochinchinensis.*
Leaves deeply 5-lobed, the lobes lobulate-sinuate, blunt, their general outline orbicular	3. *G. quinqueloculare.*

1. Gymnopetalum integrifolium, Kurz in Journ. As. Soc. Beng. XL, 58. Creeping, only a few feet long; *stem* scabrid, tendrils simple or bifid. *Leaves* reniform, obtuse; the margin undulate or denticulate, not lobed; upper surface very scabrid, the lower softly tomentose,

length 1·75–2 in., breadth ·8–2·25 in., petiole ·45–·65 in. *Flowers* monœcious, all solitary, axillary and bracteate, the *male* peduncle 1·5 in. long, the female only ·25 in. *Calyx-tube* in both sexes elongate, densely covered with long brown hairs; the teeth 5, lanceolate; *corolla* white, about 1·35 in. in diam., its lobes obovate, entire, pubescent, veined. *Fruit* about ·75 in. in diam., globular, smooth, orange-red. Kurz in Flora for 1871, p. 295; Clarke in Hook. fil. Flor. Br. Ind. II, 612. *Cucumis integri folius*, Roxb. Flor. Ind. III, 724; Wall. Cat. 6730. *Trichosanthes officinalis*, Wall. Cat. 6694. *T. integrifolia*, Kurz in Journ. As. Soc. Beng. XLVI, Pt. II, 99; Cogn. in DC. Mon. Phan. III, 386.

Perak; *Wray* 2167; *Ridley* 3107.

Kurz named this *Gymnopetalium integrifolium* in the Journal of the Asiatic Society of Bengal which was issued in March 1871. His publication of it in *Flora* dates only from October of the same year.

2. Gymnopetalum Cochinchinensis, Kurz in Journ. As. Soc. Beng. XLVI, Pt. II, 57. *Stems* slender, angled, slightly scabrid-hairy. *Leaves* reniform to triangular in outline, 5-angled or 3–5-lobed half way down; the lobes triangular, acute, the edges crenate-dentate and thickened, the base deeply and widely cordate, both surfaces more or less scabrid, length 2 to 4 in., breadth 2 to 3·5 in.; petiole scabrid-pubescent, 1–1·5 in. long; tendrils simple or bifid. *Male peduncle* longer than the leaves, the flowers racemose, or sometimes solitary; bracts large, incised-serrate, ·5–·75 in. long; calyx-tube sub-cylindric, villous, the mouth closed by deflexed hairs, the teeth erecto-patent; petals ovate-oblong, ·5 in. long, entire or sub-crenate. Peduncle of *female flower* shorter than the leaf-petiole, sparsely puberulous; *fruit* about 2 in. long. and ·75 in. in diam., somewhat scabrid, 10-ribbed, orange-red, the beak long; *seeds* about ·25 in. long. Kurz in Flora for 1871, p. 295; Clarke in Hook. fil. Flor. Br. Ind. II, 611; Cogn. in DC. Mon. Phan. III, 391. *Bryonia cochinchinensis*, Lour. Flor. Cochinch. 595; DC. Prodr. III, 305. *Momordica tubiflora*, Roxb. Flor. Ind. III, 711, (not of Wallich). *Tripodanthera cochinchinensis* Roem. Synops. II, 48. *Scotanthus tubiflorus*, Naud. in Ann. Sc. Nat. Ser. 4, XVI. 172, t. 3. *Trichosanthes cucumerina*, Wall. Cat. 6690 E. *T.*? *Fatoa*, Ham. in Wall. Cat. 6695. *Bryonia grandis*, Wall. Cat. 6700 K. L. *Trichosanthes costata*, Bl. Bijdr. 933; Ser. in DC. Prodr. III, 314.

Pahang; *Ridley* 2446. Kedah; *Curtis* 2592. Perak; *King's Collector* 10563. Distrib. British India, Malayan Archipelago, China.

3. Gymnopetalum quinquelobum, Miq. in Flor. Ind. Bat. I, Pt. I, 681. A slender annual; *stem* striate, with short pubescence or glabrous. *Leaves* orbicular in general outline, deeply 5-lobed; the lobes sinuately 2- or 3-lobulate, or oblong and subentire; both surfaces sparsely covered with thick whitish hairs with bulbous bases, length

1·5–2·25 in., breadth 1·75–3 in.; petiole ·75–1 in., sparsely pubescent. *Male flowers* usually solitary, rarely in racemes slightly longer than the leaves, shortly pilose; the bracts oblong, serrate, ·5 in. long. *Calyx-teeth* erect, entire or dentate; petals oblong, acute, puberulous outside. Peduncle of *female flower* ·5–1 in. long. *Fruit* brilliant scarlet when ripe, oblong-fusiform, acutely ribbed, shortly pubescent, 1·5–2 in. long; *seeds* blackish, rugulose, obscurely marginate, narrowed to the base, ·2 in. long and about ·1 in. broad. Clarke in Hook. fil. Flor. Brit. Ind. II, 611; Cogn. in DC. Mon. Phan. III, 392. *Scotanthus Porteanus*, Naud. in Ann. Sc. Nat. Ser. V, Vol. 5, 25. *Gymnopetalum heterophyllum*, Kurz in Trim. Journ. Bot. for 1875, p. 326.

Andaman and Nicobar Islands; *Kurz.*

4. Luffa, Cav.

Climbers, large or small, pubescent or nearly glabrous; tendrils 2–5-fid. *Leaves* cordate, usually 5-angular or 5-lobed; petiole without glands at its apex. *Flowers* yellow or white, monœcious, males and females often from the same axil; females solitary or panicled, males on long or short racemes or clustered. Male; calyx-tube turbinate, lobes 5, triangular or lanceolate; petals 5, obovate; stamens 3, rarely 5, filaments 3, free or connate; anthers exserted, free, one 1-celled, the others 2-celled; cells sigmoid, often on the margin of the broad connective. Female; calyx-tube shortly produced above the ovary; lobes and corolla as in the male; ovary oblong, style cylindric, stigma 3-lobed; ovules very many, horizontal. *Fruit* large or small, oblong (not spherical), smooth or angular or spinous, ultimately fibrous, not succulent, 3-celled, usually circumscissile near the apex. *Seeds* many, oblong, compressed. Distrib. Species 6, in the warmer regions of the Old World and one in America.

Luffa Ægyptiaca, Miller Gard. Dict. ed. VIII, ex Hook. fil. in Oliv. Flor. Trop. Afr. II, 530. *Stem* stout, many yards in length; the young branches glabrous, angled and very deeply sulcate; tendrils 2–3-fid. *Leaves* large, reniform or reniform-orbicular in general outline, palmately 5-lobed; the lobes acute, lobulate and denticulate; both surfaces scabrous or scaberulous, punctate, glabrous except the pubescent nerves on the lower surface; length 2·5–6 in., breadth 3–9 in., petiole 2–2·5 in., pubescent, eglandular. *Male peduncle* 6 in. long; the flowers 4–12, crowded near the summit, 1·5–2 in. in diam., their pedicels short, each with a small ovate viscid bract, or ebracteate; petals 5, yellow with green veins; stamens 5. *Female flower* solitary on a peduncle 1–3 in. long, usually from the same axil as the male inflorescence; fruit 5–12 in. long, sub-cylindric, with numerous bold ridges; *seeds* usually black,

narrowly winged, smooth or slightly tubercled. DC. Prodr. III, 303; Clarke in Hook. fil. Flor. Brit. Ind. II, 614. *Cucumis aegyptiacus*, Vesl. in Alp. Pl. Aegypt. p. 199, t. 58, 59. *Momordica Luffa*, Linn. Spec. ed. 1, 1009. *L. pentandra*, Roxb. Flor. Ind. III, 712; W. & A. Prodr. 343; Wall. Cat. 6751; Wight Ic. t. 499. *L. racemosa*, Roxb. l. c. 715. *L. clavata*, Roxb. Hort. Beng. 104; Flor. Ind. III, 714. *L. acutangula*, W. & A. l. c., (not of Roxb.). *L. cylindrica*, Roem. Synops. II, 63; Naud. in Ann. Sc. Nat. Ser. 4, XII, p. 119; Kurz in Journ. As. Soc. 1877, Pt. II, 100; Cogn. in DC. Mon. Phan. III, 456. *L. Petola and L. Cattu-picinna*, Seringe in DC. l. c. *L. Parvala*, Wall. Cat. 6758. *L. Gosa, hederacea and Satpatia*, Wall. Cat. 6753, 6755, 6757. *Bryonia cheirophylla*, Wall. Cat. 6715 A.

Perak; *King's Collector* 1020. Distrib. British India and in the Tropics generally; often cultivated.

The synonymy of this species occupies more than a page in Cogniaux's excellent Monograph of the *Cucurbitaceæ* in De Candolle's *Suites au Prodromus*, Vol. III. I have followed Messrs. Cogniaux and C. B. Clarke in reducing here Roxburgh's three species *L. pentandra*, *L. racemosa* and *L. clavata*, but I do so with considerable hesitation. Neither in flower nor leaf do Roxburgh's figures of his *L. clavata* and *L. pentandra* much resemble each other, whatever relation either of them may bear to *M. Aegyptiaca*, Miller. The material of the Indian species in the Calcutta Herbarium is very unsatisfactory, and I do not think the last word on them will be said until they have been carefully cultivated side by side, and studied as they grow.

5. Benincasa, Savi.

A large climber, softly hairy, tendrils 2- or 3-fid, rarely simple. *Leaves* cordate, reniform-orbicular, more or less 5-lobed; petiole without glands. *Flowers* large, yellow, monœcious, all solitary, without bracts. Male; calyx-tube campanulate; lobes 5, leaf-like, serrate; petals 5, nearly separate, obovate; stamens 3, inserted near the mouth of the tube; anthers exserted, free, one 1-celled, two 2-celled, cells sigmoid. Female; calyx and corolla as in the male; ovary oblong, densely hairy; style thick, with 3 flexuose stigmas; ovules numerous, horizontal; placentas 3. *Fruit* large, fleshy, oblong, pubescent, indehiscent. *Seeds* many, oblong, compressed, margined.

Benincasa hispida, Cogn. in DC. Mon. Phan. III, 513. Annual. *Leaves* on long petioles, reniform-rotund, with 5–9 small lobes, all toothed, 4–6 in. long and about the same in breadth; petioles cylindric, longer than the leaves, tendrils usually 3-fid. *Male flowers* axillary, solitary, peduncled, yellow, 1·5 in. in diam.; teeth of the calyx obtusely pinnatifid or undulate. *Female flowers* like the male, axillary, solitary, peduncled; calyx as in the male. *Fruit* sub-cylindric, obtuse at the ends, smooth, hairy when young but glabrous and with a whitish

bloom when ripe, 12–18 in. long and from 8–10 in. in diam. *Seeds* white with tumid margins, ·5 in. long and ·15 in. broad. *Cucurbita hispida*, Thunb. Flor. Jap. (1784), p. 322; Bl. Bijdr. 931; Wall. Cat. 6723. *C. Pepo*, Lour. Flor. Coch.-Chin. p. 593; Roxb. Flor. Ind. III, 718 (*not of Linn.*). *Benincasa cerifera*, Savi in Bibl. Ital. IX, 159; DC. Prodr. III, 303; W. et Arn. Prodr. 344; Miq. Flor. Ind. Bat. I, Pt. I, 665; Clarke in Hook. fil. Flor. Br. Ind. II, 616. *Cucurbita villosa*, Bl. Bijdr. 931; DC. Prodr. III, 317. *C. farinosa*, Bl. Bijdr. 931. *Cucurbita alba*, Roxb. in E. Ind. Comp. Mus., tab. 457 (ex W. et Arn.). *Gymnopetalum septemlobum*, Miq. Flor. Ind. Bat. I, Pt. I, 679. *Lagenaria dasystemon*, Franch. et Sav. Enum. Pl. Jap. I, 173.

Nicobar and Andaman Islands; cultivated, *King's Collectors.* Distrib.—Malayan Archipelago, Australasia, China, Philippines, British India; cultivated.

6. Momordica, Linn.

Climbing by simple tendrils. *Leaves* cordate, petioled, undivided in the Indian species. *Flowers* yellow or white, monœcious or diœcious, females solitary, peduncled; males solitary or racemed, bracteate or not. Male; calyx-tube short, campanulate with 2–3 basal oblong incurved scales (ex Hook. f.) lobes 5; *corolla* 5-partite nearly to the base; stamens 3; filaments short; anthers at length free, one 1-celled, one or two 2-celled, cells conduplicate or horse-shoe-shaped. Female; calyx and corolla as in the male; ovary oblong; style long, stigmas 3; ovules very many; placentas 3, horizontal. *Fruit* oblong or spherical, rough or smooth, indehiscent or 3-valved, many- or few-seeded. *Seeds* obovate or complanate, smooth, corrugate or sculptured. Distrib.—Species 25, chiefly in the warmer parts of Africa, several in Tropical Asia, a few in Tropical America.

Leaves entire :—	
Male pedicels ebracteate	1. *M. Clarkeana.*
Male pedicels with a bract close to the flower ...	2. *M. subangulata.*
Leaves 3-lobed, the lobules entire	3. *M. Cochinchinensis.*
Leaves 5–7-lobed, the lobules sinuate-dentate or lobulate	4. *M. Charantia.*

1. Momordica Clarkeana, n. spec. King. *Stem* slender, 4-angled, glabrous, 20–30 feet long. *Leaves* thinly membranous, broadly ovate, never lobed, acute, the base deeply cordate or emarginate, both surfaces quite glabrous; length 3–5 in., breadth 3–4 in.; petiole 1·5–2 in., slender, eglandular. *Male flowers* ·75 in. in diam., on filiform pedicels several form a leaf-axil, or in few-flowered lax racemes; calyx-lobes puberulous, broad, obtuse, their margins membranous and glabrous; *corolla* deeply divided into 5 broad blunt lobes, puberulous. *Female flower* unknown.

Fruit vermillion when ripe, sub-globular, apiculate when young glabrous; without ridges or papillæ, 2–2·5 in. in diam.; *seeds* as in *M. Cochinchinensis.*

Perak; *Scortechini* 1605; *King's Collector* 8340; *Wray* 3273.

This species is allied to *M. Cochinchinensis* and has seeds exactly alike those of that species. But the leaves of this are of thinner texture than those of *M. Cochinchinensis*, and they are not lobed; moreover the petiole in this is eglandular, and the fruit is quite free from ridges or papillæ of any kind. I have named it in honour of my friend Mr. C. B. Clarke who believes with me that it is a hitherto undescribed species.

2. Momordica subangulata, Blume Bijdr. 928. *Stem* slender, glabrous, angled, sulcate, several feet long; tendrils single. *Leaves* broadly ovate, deeply cordate at the base, the apex acute, the edges with remote cartilaginous teeth; upper surface glabrous, the lower with sparse small adpressed hairs; length 1·75–2·25 in., breadth 1·25–1·65 in.; petiole 1 in. long, glabrous, eglandular. *Male* peduncle ·5–1 in. long, pubescent; the bract close to the flower broader than long, its apex obtuse, its base cordate, minutely pubescent, the veins prominent; flower nearly 1 in. in diam.; calyx deep purple; its lobes oblong, obtuse, glandular, nearly ·2 in. long; corolla yellow, partite to the base, the segments oblong. *Female* flower unknown; *fruit* ellipsoid, 2–3 in. long, obscurely ribbed, the ribs broken into joints. Ser. in DC. Prodr. III, 316; Roem. Syn. fasc. 2, p. 58; Miq. in Flor. Ind. Bat. I, Pt. I, 664; Kurz in Journ. As. Soc. Beng. XLVI, Pt. II, 102; Cogn. in DC. Mon. Phan. III, 443.

Perak; *Scortechini* 399. Distrib. Java, Brit. India.

3. Momordica Cochin-Chinensis, Spreng. Syst. Veg. III, 14. A powerful climber ascending tall trees; *stem* angled, glabrous. *Leaves* in general outline sub-orbicular or broadly ovate, the base cordate or emarginate, usually 3-lobed to the middle or below it (sometimes 5-lobed), the margins with sparse umbilicate glands, both surfaces glabrous, length 4–7 in., breadth nearly the same; petiole 2–3 in. long, glandular at the middle and upper part; tendrils long, stout, simple. *Male peduncle* 2–6 in. long with an orbicular-reniform cucullate bract at its apex embracing the flower-bud; calyx-segments dark, coriaceous, hairy; corolla 1·75–3 in. across, white tinged with yellowish, some of the petals with black spots at the base, others with yellow glands. *Female* peduncle 1–2 in. long, (longer in fruit), with a small bract about the middle. *Fruit* ovate, pointed at the apex, fleshy, bright red and covered with conical points but not ribbed; 4–5 in. long; seeds numerous, blackish, ovate, compressed, sculptured, the margins undulate-sub-lobulate. Kurz in Journ. As. Soc. Beng. XLVI, Pt. 2, 102; Clarke in Hook. fil. Flor. Br. Ind. II, 618; Cogn. in DC. Mon. Phan. III, 444.

M. mixta, Roxb. Hort. Beng. 70; Flor. Ind. III, 709; Wight & Arn. Prodr. 349; Roem. Syn., fasc. 2, 59; Hook. in Bot. Mag. t. 5145; Miq. Flor. Ind. Bat. 1, Pt. 1, 664; Naud. in Ann. Sc. Nat. Ser. 4, XII, 132. *M. dioica*, Wall. Cat. (not of Roxb.) 6750, A to F. *Muricia Cochinchinensis*, Lour. Flor. Coch.-Chin. 733; Ser. in DC. Prodr. III, 318.

Perak; *Scortechini*, *King's Collector*, *Wray*; a common plant. Distrib.—British India, Malaya, Philippines.

4. Momordica Charantia, Linn. Sp. Pl. ed. I, p. 1009. *Stem* slender, branching, striate, pubescent, sometimes tomentose towards the apex, 3–6 feet long. *Leaves* reniform-orbicular in general outline, 1–3 in. in diam., deeply divided into 5–7 lobes; the lobes sinuate-dentate or lobulate and mucronate, constricted at the base, glabrous or slightly pubescent; petiole 1–3 in.; the tendrils simple. *Male peduncle* slender, with a reniform or orbicular bract at or below the middle. *Male flower* ·35–·75 in. in diam.; the calyx-lobes ovate, acute; *corolla* somewhat irregular, yellow, its segments obtuse or emarginate, anther cells much bent. *Female peduncle* 2–4 in. long, slender, bracteate near the base; ovary fusiform, muricate. *Fruit* 1–3 in. long, ovoid, tapering to both ends, many-ribbed and bearing numerous triangular tubercles. *Seeds* compressed, sometimes almost 3-toothed, the margins corrugated, the sides sculptured. Lour. Flor. Cochchin. II, p. 598; Bot. Mag. t. 2455; Ser. in DC. Prodr. III, 311; Roxb. Flor. Ind. III, 707; Wight and Arn. Prodr. 348; Torr. and Gray Flor. N. Amer. I, 543; Wight Ic. tab. 504; Wight Ill. t. 105 *bis*; Miq. Flor. Ind. Bat. I, Pt. I, 663; Cogn. in Mart. Flor. Bras., fasc. 78, p. 14; Clarke in Hook. fil. Flor. Br. Ind. II, 616. Cogn. in DC. Mon. Phan. III, 436. *M. muricata*, Willd. Spec. IV, 602; Roxb. Flor. Ind. III, 707; W. & A. Prodr. 348; Miq. Flor. Ind. Bat. I, Pt. I, 663. *M. humilis*, Wall. Cat. 6747. *M. anthelmintica*, Schum. et Thou. Flor. Guin. 423. *M. Roxburghiana*, Don Gen. Syst. Gard. III, 35. *M. macropetala*, Mart. in Hook. Journ. Bot. V, 504.

Perak; *Scortechini*. Distrib. Malayan Archipelago, British India, China, Tropical Africa and America.

7. Melothria, Linn.

Climbing herbs; tendrils simple or 2-fid. *Leaves* petioled, deltoid, truncate or hastate, entire or deeply 3-lobed, little hairy, often punctate. *Flowers* small, white, usually monœcious, males and females often from the same axil; male pedicels long, clustered (rarely sub-solitary) in the axils, or clustered on long racemes resembling branches without leaves; female long-pedicelled. *Male;* calyx-tube short, teeth 5, small; corolla 5-partite; stamens 3, inserted in the middle of the calyx-tube; anthers free, one 1-celled, two 2-celled; cells free, straight, simple, more or less

lateral; connective prolonged, undivided, glabrous. *Female* calyx and corolla as in the male; ovary oblong, style long; stigmas 3, subglobose; ovules many, horizontal; placentas 3, vertical. *Fruit* indehiscent, globose, acute or fusiform, subrostrate. *Seeds* many, small, oblong, much compressed, obscurely margined, smooth or very nearly so. DISTRIB. Species about 55, all tropical.

Fruit not beaked :—				
Fruit globular, glabrous	...	...	...	1. *M. affinis.*
Fruit oblong, glabrous	...	...	...	2. *M. indica.*
Fruit beaked :—				
Fruit fusiform, beaked, velvety	...	...	...	3. *M. marginata.*

1. MELOTHRIA AFFINIS, n. spec. King. Scandent; the stem slender, glabrous, 4-angled and deeply sulcate, not rooting at the nodes; the tendrils rather stout, bifid. *Leaves* ovate-cordate to triangular, often 3–5-lobed, the edges denticulate; upper surface densely scabrid-hispid, the hairs white; the lower paler and with hairs of the same colour but sparser and more slender; length 1·35–4·25 in., breadth 1·5–3·25 in., petiole ·5–1 in. *Male* and *female* flowers often from the same axil; the *males* in many-flowered umbels on pedicels twice as long as the leaf-petioles, pubescent below, glabrous above; pedicels about 20, slender, unequal, dilated at the apex, glabrous, ·25–·35 in. long. *Flowers* ·1 in. in diam., globose, pubescent, with 5 slender short diverging subulate teeth below the mouth. *Petals* not seen; *anthers* 3, straight, the connective not produced. Pedicel of the *fruit* shorter and stouter than the peduncle of the male umbel, glabrous. *Fruit* globose, glabrous, thin-walled, many-seeded, red when ripe, ·4–·5 in. in diam.; *seeds* obovoid, pitted, somewhat compressed, pale.

PERAK; *Scortechini* 495; *Wray* 860, 1404; *Curtis; King's Collector* 1069, 2539. BORNEO; BANGERMASSING; *Motley* 167.

Mr. C. B. Clarke, who was so good as to examine my specimens of this species and to compare them for me at Kew, assures me that the Perak specimens agree exactly with Motley's 167. Mr. Clarke considers the species as closely allied to *M. marginata*, Cogn. from which it differs by its globular glabrous fruit.

2. MELOTHRIA INDICA, Lour. Flor. Coch. China, 35. *Stem* slender, filiform, glabrous, 3–6 feet long, often rooting at the nodes, the tendrils simple. *Leaves* triangular-cordate, acute, entire or 3-lobed (sometimes deeply); the nerves somewhat hairy, otherwise glabrous, the lobes irregularly denticulate or lobulate; length 1·25–2 in. and breadth the same, petiole ·6–1 in. *Male pedicels* solitary or in racemes of 2 or 3 on peduncles 1 in. long; calyx-tube broadly campanulate, its teeth subulate, spreading; *corolla* white, puberulous, its segments ovate-oblong. *Stamens* with thick obconic filaments, glabrous or sparsely villose; *anthers* ovate-oblong, ciliate, the connective much produced. *Peduncle*

of *female* flower solitary, longer that the leaf-petiole. *Fruit* oblong, glabrous, white, ·5–·75 in. long. *Seeds* ovate, attenuate at the base. Ser. in DC. Prodr. III, 313; Naud. in Ann. Sc. Nat., Ser. 4, XVI, 169 t. 2; Hance Suppl. Hongkong Flora, 104; Kurz in Journ. As. Soc. Beng. XLVI, Pt. II, 105; Clarke in Hook. fil. Flor. Br. Ind. II, 626. *Bryonia geminata*, Blume Bijd. 924; Ser. in DC. Prodr. III, 305; Roem. Syn., fasc. II, 35; Miq. Flor. Ind. Bat. I, Pt. I, 659. *B. tenella*, Roxb. Flor. Ind. III, 725. *Aechmandra indica*, Arn. in Hook. Journ. Bot. III, 274; Wight in Ann. and Mag. Nat. Hist. VIII, 267; Miq. Flor. Ind. Bat. I, Pt. I, 658.

Selangore; *King's Collector* 360. Distrib. British India, Cochin-China, Philippines, Hongkong.

3. Melothria marginata, Cogn. in DC. Mon. Phan. III. 593. *Stem* creeping, rooting at the nodes, angular, sulcate, glabrous; the tendrils slender, simple, puberulous. *Leaves* ovate-cordate or more or less 3-lobed, acute; the edges minutely and distantly denticulate; the upper surface coarsely and distinctly and the lower minutely and more closely strigose, the nerves on both pubescent; length 1–1·25 in., breadth 1–1·75 in.; petiole ·75–1·5 in., tomentose. *Male flowers* umbellate on a filiform few-flowered peduncle shorter than the petiole, glabrous; the pedicels erect, ·2–·3 in. long; the calyx broadly campanulate, pubescent, its teeth subulate. *Petals* villose, yellow; anthers glabrous, inappendiculate. *Female flower* solitary on a peduncle ·5 in. long. *Fruit* narrowly cylindric, beaked, tapering to the base, velvety, ·75 in. long, its peduncle filiform; *seeds* 6–8, foveolate. *Bryonia marginata*, Blume Bijdr. 924; Ser. in DC. Prodr. III, 305; Roem. Syn., fasc. II, p. 36; Miq. Flor. Ind. Bat. I, Pt. II, 660. *B. epigæa*, Blume Bijdr. 924; Ser. in DC. Prodr. III, 306. *Aechmandra Blumeana*, Roem. Syn. fasc. II, p. 33; Miq. Flor. Ind. Bat. I, Pt. II, 657. *Melothria Rumphiana*, Scheff. Ann. Jard. Bot. Buitenz. I, 25. *Cerasiocarpum? Maingayi*, Clarke in Hook. fil. Flor. Br. Ind. III, 629.

Malacca; *Maingay* (Kew Distrib.) 1268. Perak; *King's Collector* 874. Distrib. Java and Sumatra.

Var. *heterophylla*, Cogn. in DC. Mon. Phan. III, 594. *Leaves* quite entire, ovate-cordate or oblong-sub-hastate, scabrous above, almost smooth beneath but hairy on the nerves. *Bryonia heterophylla*, Blume Bijdr. 925; Wall. Cat. 6704; Roem. Syn., fasc. II, 35. *B. Blumei*, Ser. in DC. Prodr. III, 305; Miq. Flor. Ind. Bat. I, Pt. I, 659. *Cerasiocarpum? penangense*, Clarke in Hook. fil. Flor. Br. Ind. III, 629.

Penang; *Wallich; Curtis* 1928. Distrib. Java.

NOTE.

There are in the Calcutta Herbarium specimens of several species of *Melothria*

which Mr. C. B. Clarke, (who elaborated the family of *Cucurbitaceæ* for Hooker's Flora of British India, and who kindly compared my Malayan material in the Kew Herbarium) considers as probably new. But, as these want either flowers or fruit, I am obliged to leave them undescribed. The chief amongst these are Perak, Wray 2228 and 3416; and Andamans, King's Collector 2200.

8. Gynostemma, Blume.

Climbing herbs, tendrils simple. *Leaves* pedate; leaflets 3–5, ovate-lanceolate, serrate, membranous. *Flowers* small, dicœcious, in axillary diffuse panicles, greenish. *Male flower;* calyx short, with 5 small lobes; corolla rotate, 5-partite, with lanceolate segments; stamens 5, filaments connate below; anthers 2-celled, the cells straight and elongate. *Female flower*, calyx and corolla as in the male; ovary rotund, 2–3-celled; styles 2 or 3, united below, bifid at the apex; ovules 2 in each cell, pendulous. *Fruit* globose, umbonate, indehiscent, as large as a pea, 1–3-seeded. *Seeds* wingless, verrucose, sub-muricate. Species 4; all Indo-Malayan.

Gynostemma pedata, Blume Bijdr. 23. Slender, 10–20 feet long; young branches and leaves puberulous or glabrous, rarely pubescent. *Leaves* membranous, trifoliolate or pedate, the petioles 1–1·5 in. long; leaflets 3–7, ovate-oblong, lanceolate or oblanceolate, unequal, the middle the longest, their apices acute or sub-acute, the bases narrowed and sometimes oblique, the edges crenulate or crenate-dentate; length ·75–2·5 in., breadth ·4–1 in., the petiolules ·1–·2 in. *Panicles* longer than the leaves, 3–6 in. or even a foot long, slender, sparsely branched, more or less coarsely pubescent. *Calyx-segments* triangular, acute; segments of *corolla* 1-nerved, ciliate-dentate. *Fruit* ·15 in. in diam. *Seeds* trigonous. Roem. Syn., fasc. II, p. 110; Miq. Flor. Ind. Bat. I, Pt. I, 683; Clarke in Hook. fil. Flor. Br. Ind. II, 633; Cogn. in DC. Mon. Phan. III, 913. *G. laxa*, Cogn. Mon. Phan. III, 914; *Zanonia laxa*, Wall. Cat. 3727; Pl. As. Rar. II, 29; Arn. in Hook. Journ. Bot. III, 272 (*in note*). *Zanonia cissoides*, Wall. Cat. 3726; Pl. As. Rar. II, 28. *L. Wightiana*, Arn. Pugill. 38; Nov. Act. Acad. Nat. Cur. 18, Pt. I, 356; Roem. Syn., fasc. II, 117. *Alsomitra laxa*, Roem. Syn., fasc. II, 118. *Pestolozzia laxa*, Thw. Enum. Pl. Zeyl. 124. *P. pedata*, Zoll. et Moritz. Syst. Verz. p. 31. *Alsomitra cissoides*, Roem. Syn., fasc. II, 118. *Enkylia trigyna*, Griff. Pl. Cantor. 27; Miq. Prol. Flor. Jap., pp. 15 and 142. *E. digyna*, Griff. Pl. Cantor. 27. *Zanonia pedata*, Miq. Flor. Ind. Bat. I, Pt. I, 683. *Gynostemma cissoides*, Franch. et Sav. Enum. Pl. Jap. I, 176. *Vitis atroviridis*, Wall. Cat. 6040; *Vitis trichophora*, Wall. Cat. 9032.

Perak; *King's Collector* 2306. Distrib. Malayan Archipelago, British India and Tonkin.

This plant varies as to the number of its leaflets in its leaves and as to pubescence. The pedate forms with 5–7-puberulous leaflets have been by some authors (among whom is M. Cogniaux, the latest monographer of the *Cucurbitaceæ*) considered as belonging to a different species from the plants with trifoliolate glabrous shining leaves; and the latter has been named *G. laxa*. After carefully examining about a hundred specimens collected in different parts of British India and Malaya, I find so many that unite to some extent the characters relied upon as distinctive that I have been driven, with all respect to M. Cogniaux, to adopt Mr. Clarke's view that there is but a single species.

9. Zanonia, Linn.

Climbing herbs; tendrils simple. *Leaves* long-petioled, simple, ovate or oblong. *Flowers* small, dicœcious, in large compound pendulous racemes, males pedicelled, females subsessile. *Male*; sepals 3, oblong or orbicular, concave; corolla rotate, 5-partite, the segments subacute; stamens 5, free, inserted on a fleshy disc, filaments very short; anthers 1-celled, transversely oblong. *Female*; calyx and corolla as in the male; ovary sub-clavate, at first 3-celled; styles 3, spreading, 2-fid at the apex; ovules in each cell 2 or many, pendulous, attached in 2 series to a fleshy parietal placenta. *Capsule* large, elongate-cylindric, clavate, 3-valved at the truncate apex. *Seeds* large, oblong, pendulous, compressed, surrounded by a large membranous wing. Distrib. Species 3; British India, Malaya.

Leaves ovate-oblong; fruit 2·5 in. long	...	...	1. *Z. indica.*
Leaves ovate-rotund; fruit 5–8 in. long	...	...	2. *Z. Clarkei.*

1. Zanonia indica, Linn. Spec. Pl. ed. II, 1457. Slender, climbing to the extent of 30–50 feet, glabrous. *Leaves* coriaceous, ovate-oblong, acute; the base 3-nerved, rounded or somewhat emarginate; main nerves 6–8 pairs, curved, spreading, prominent beneath; length 3·5–6 in., breadth 2–3·5 in., petiole ·65–·8 in. *Fruit* cylindric-campanulate, glabrous, the apex truncate, 2·5 in. long; *seeds* flat, thin, 1·5–1·75 in. long; the nucleus oval, only ·6 in. long, the rest being wing. Blume Bijdr. 937; Ser. in DC. Prodr. III, 298; Roem. Syn. fasc. II, 117; Wight and Arn. Prodr. 340; Wight Ill. t. 103; Miq. Flor. Ind. Bat. I, Pt. I, 682; Thwaites' Enum. Pl. Zey. 124, 442; Clarke in Hook. fil. Flor. Br. Ind. II, 633; Trimen Flora Ceylon II, 261.

Perak; *King's Collector* 7198, 7362.

2. Zanonia Clarkei, n. spec. King. Slender, 60–80 feet long, glabrous, the young branches deeply grooved. *Leaves* coriaceous, ovate-rotund, acute; the base broad, emarginate or slightly cordate, with 5–7 nerves radiating from the apex of the petiole (the lateral one on each side small); length 2·5–3·5 in., breadth 2·5–3 in., petiole ·75 in., tendrils bifid. *Flowers* unknown. *Fruit* ovoid-cylindric, smooth, 5–8 in. long,

and 3 in. in diam. *Seeds* flattened, about ·1 in. thick, ovate, with 6 unequal deep narrow marginal lobes (those at the ends being the longest), the seed proper or nucleus papillose, 1 in. long and ·75 in. broad, surrounded on all sides by a thin membranous wing nearly 1 in. wide.

Perak; *King's Collector* 7230.

This fine species is known only from a single gathering of six specimens, none of which bears a flower. My friend Mr. C. B. Clarke, F.R.S., who was so kind as to compare for me at Kew the whole of my Malayan Cucurbits, notes on this as follows: "This is either a new *Zanonia* near *Z. indica*, Linn., or a new *Alsomitra* near *A. Capricornica*, F. Müll.—I think a *Zanonia*, whether the sepals turn out to be 5 or not. The 2-fid cirrhi may do for either genus. The spinose-margined seeds are not like those of *Zanonia*; but the ovoid, or sub-globose fruit is like nothing out of section *Macrozanonia*, Cogn. I call it *Zanonia*, n. spec."

10. Alsomitra, Bth. & Hk. f.

Large climbers; tendrils simple or 2-fid. *Leaves* with 3 oblong entire leaflets. *Flowers* small, dicœcious, white, in compound panicles with filiform branches. *Male;* calyx rotate, 5-partite, segments oblong, acute; corolla rotate, 5-partite, segments obtuse; stamens 5, filaments short, near together at the base; anthers small, oblong, straight, 1-celled. *Female;* calyx and corolla as in the male; ovary elongate-clavate, 1-celled; styles 3–4, conical, with semi-lunate stigmas; ovules very many, pendulous; placentas 3, thick, vertical, parietal. *Capsule* large, elongate-clavate, truncate and 3-valved at the apex. *Seeds* very many, compressed, vertical, in six rows, much corrugated, incised or horned on the margin with a terminal membranous wing longer than the seed. Distrib. Species 9; British India, Malaya, North Australia, S. America.

Alsomitra clavigera, Roem. Syn. fasc. II, p. 118. A slender glabrous climber. *Leaflets* fleshy, the middle the largest, oblong or oblong-lanceolate, the apex obtuse, the base narrowed, the edges entire, subsessile, eglandular, length 1·5–3 in., breadth ·65–1 in. *Panicles* slender, twice as long as the leaves, longer in fruit. *Capsule* smooth, 1·25–1·5 in. long and ·4 in. broad. *Seeds* dark, cinereous, shortly muricate. Cogniaux in DC. Mon. Phan. III, 927; Hook. fil. in Bot. Mag. t. 6017; Clarke in Hook. fil. Flor. Br. Ind. II, 634. *Zanonia sarcophylla*, Wall. Cat. 3724; Pl. As. Rar. II, 28, t. 133.

Kedah; *Curtis* 2504.

Ordered LVI. ARALIACEÆ.

Trees or shrubs, very rarely herbs, often scandent, sometimes prickly. *Leaves* alternate, the uppermost rarely sub-opposite, long-

petioled, large, simple or compound; stipules adnate to the petiole, sometimes inconspicuous or 0. *Flowers* regular, small, often polygamous, in umbels racemes or umbellate panicles; bracts and bracteoles small or conspicuous; pedicels continuous with the base of the calyx or jointed. *Calyx-tube* adnate to the ovary; limb truncate, obsolete or with small teeth. *Petals* 5, rarely 6–7 or many, valvate or sub-imbricate, expanding or calyptrate. *Stamens* as many as and alternate with the petals (very many in *Tupidanthus*), inserted round an epigynous disc. *Ovary* inferior, 2-celled, or cells as many as the stamens, or 1-celled; styles as many as the cells, distinct or united; ovules solitary and pendulous in each cell. *Fruit* coriaceous or drupaceous, usually small, one or more cells sometimes suppressed. *Seed* pendulous, albumen uniform or ruminate; embryo minute, radicle next the hilum. DISTRIB. Species 400, chiefly tropical and subtropical, a few in the cool temperate zones.

Petals imbricate (slightly); pedicels of flowers jointed :—	
Styles 2–5, free; leaves compound	1. ARALIA.
Styles 3 or 4, free; leaves simple, entire, lobed or pinnatifid; ovary 1-celled	2. ARALIDIUM.
Petals valvate; stamens not exceeding 12 :—	
Albumen uniform, ovary 4–12-celled, pedicels continuous with the flower, leaves simple or digitately compound :—	
Fruit boldly ridged, never more than ·3 in. long; leaves usually compound	3. HEPTAPLEURUM.
Fruit succulent, ovoid-rotund, ·5 in. in diam.; leaves simple, large, rotund-reniform, lobed ...	4. TREVESIA.
Fruit succulent, ·3 in. in diam., obscurely ridged; leaves simple, entire (palmately lobed in young shoots)	5. DENDROPANAX.
Albumen ruminate :—	
Ovary 1-celled :—	
Ovary 1-ovulate, leaves compound	6. ARTHROPHYLLUM.
Ovary with 2 ovules; fruit 2-celled, 2-seeded, leaves simple	7. WARDENIA.
Ovary 2-celled, pedicels continuous :—	
Style distinct; leaves pinnately decompound ...	8. HETEROPANAX.
Styles combined; leaves digitate, palmate or angled	9. BRASSAIOPSIS.
Ovary 4- or 5-celled, pedicels jointed	10. HETEROPSIS.
Petals valvate; stamens 30–50	11. TUPIDANTHUS.

1. ARALIA, Linn.

Herbs, shrubs or small trees, glabrous, hairy or prickly. *Leaves* alternate or whorled, digitate, pinnate or compound-pinnate; leaflets

serrate or nearly entire; bracts and stipules not prominent. *Umbels* solitary or in racemes or panicles, rarely in compound umbels; pedicels usually jointed close under the flower. *Flowers* often polygamo-monœcious. *Calyx* with its margin truncate or 5-toothed. *Petals* 5, ovate, imbricate in bud. *Stamens* 5. *Ovary* 2–5-celled; styles 2–5, free or shortly connate at base. *Fruit* 4–5-celled, 4–5-angular, or subglobose, 2–3-celled. *Albumen* uniform. DISTRIB. Species about 50; extending from India and Malaya to Japan and North America.

Leaflets entire or minutely serrulate, densely ferrugineous-tomentose on the lower surface	1. *A. Thomsoni.*
Leaflets coarsely and somewhat unequally serrate, the lower surface with scattered flexuose white hairs	2. *A. armata.*
Leaflets obscurely undulate-serrate, quite glabrous on both surfaces, the lower sub-glaucous	3. *A. ferox.*

1. ARALIA THOMSONI, Seem. Rev. Hed. 91. A large prickly shrub, all parts more or less softly pubescent or tomentose. *Stem* slender, the prickles remote. *Leaves* large, 2–3-pinnate; leaflets thickly membranous, 5–9 in each ultimate pinnule, ovate-lanceolate, acuminate, the base rounded and somewhat oblique; the petiolules of all except the terminal very short (usually less than ·1 in. long), that of the terminal leaflet ·5 in. or upwards, the edges entire or minutely serrulate; upper surface sparsely strigose, the nerves and midrib pubescent; the lower softly tomentose; length 2·5–3·5 in., breadth 1–1·75 in. *Panicles* 15–20 in. long, with short sub-horizontal branches; the ultimate branches umbellate; the bracts narrowly lanceolate, ·25 in long. *Fruit* ·15 in. long, somewhat wrinkled, glabrous, the ridges broad. Clarke in Hook. fil. Flor. Br. Ind. II, 723.

PAHANG; *Ridley* 2450. PENANG; *King's Collector* 1574; *Curtis* 462. PERAK; *King's Collector* 7807, 8704, 10045.

2. ARALIA ARMATA, Seem. Rev. Hed. 91. A prickly shrub; stem slender, almost glabrous except the puberulous young parts. *Leaves* very large, 3-pinnate, the rachises puberulous; leaflets thinly membranous, 9–11 in each ultimate pinnule, ovate-lanceolate, acuminate, the edges coarsely and somewhat unequally serrate; the base rounded, slightly oblique or sub-cordate; sessile except the terminal one; petiolule of the terminal leaflet under 1 inch; length of leaflets 3–5 in., breadth 1·5–2 in.; upper surface with a few sparse adpressed hairs, otherwise glabrous; lower with scattered white flexuose hairs especially on the nerves and midrib. *Panicle* 15–18 in. long, pubescent in its ultimate 3-fid branches, the lower part glabrous, ultimate branchlets umbellate; the pedicels slender ·3–·4 in. long, tomentose. *Fruit* nearly ·2 in. long, glabrous; the ridges broad, flat. Kurz For. Flora Burma, I, 536;

Clarke in Hook. fil. Flor. Br. Ind. II, 723. *Panax armatum*, Wall. Cat. 4933; G. Don. Gen. Syst. III, 386.

KEDAH; *Curtis* 2526. DISTRIB. British India; in Burma, the Khasia Hills and on the lower slopes of the Eastern Himalaya.

3. ARALIA FEROX, Miq. Flor. Ind. Bat. I, Pt. I, 750. A lax spreading glabrous shrub, often scandent to 20 or 30 feet; the stems, branches, rachises of the leaves and inflorescence bearing numerous short recurved spines. *Leaves* 2–3-pinnate, the pinnæ 3 or 4 pairs; leaflets subcoriaceous, 3–5 in a pinna, the pairs opposite, ovate, acute, the bases rounded, the edges obscurely undulate-serrate; both surfaces glabrous, the upper shining when dry, the lower sub-glaucous; length 1–2 in., breadth ·75–1 in.; petiolules unequal, the lateral ·15–·3 in., the terminal ·5–·65 in. long. *Panicle* terminal, 8–15 in. long and 6 in. across, with numerous slightly compressed horizontal branches, themselves branching and ultimately ending in numerous peduncled umbels of 10–15 long-pedicelled oblong flowers ·1 in. long; the pedicels slender, ·3–5 in. long. *Calyx-tube* campanulate, 10-ridged, the limb with 5 small triangular acute teeth. *Petals* ovate. *Fruit* ovate-globose, boldly 5-ridged, rather more than ·1 in. long.

PERAK; *Scortechini* 142, 501; *King's Collector* 1037, 4434, 5089, 8438, 10568; *Wray* 2155.

2. ARALIDIUM, Miq.

Leaves large, simple, usually deeply lobed or pinnatifid, glabrous. *Flowers* male or hermaphrodite, in large compound panicles, minute. *Calyx-teeth* triangular, spreading, the tube campanulate. *Petals* 5, imbricate. *Stamens* 5. *Ovary* usually 3-celled, two of the cells soon aborting. *Styles* distinct, subulate. *Fruit* obliquely ovoid, drupaceous, 1 inch or more in length, 1-seeded; the seed solitary, rugose, pendulous, vertically sulcate; albumen very copious, coarsely ruminate, penetrated by outgrowing folds from the funicle; embryo small. DISTRIB; two species, both Malayan.

This is a remarkable genus of doubtful position. The large solitary seed, with a much developed funicle forming an expansion at the base of the coarsely ruminated albumen and sending processes into the latter, and the unisexual habit make it doubtful whether it should not be placed in *Cornaceæ* (to which Seemann referred it), rather than in *Araliaceæ*.

ARALIDIUM PINNATIFIDUM, Miq. Flor. Ind. Bat. I, 763, t. 13. A small tree without prickles, glabrous except the inflorescence. *Leaves* thinly coriaceous, irregularly lobed or coarsely pinnatifid, rarely entire and narrowly elliptic; length of the lobed or pinnatifid forms 10–18 in., breadth 7–10 in.; length of the entire leaves 4–10 in., breadth 2–4 in.; petiole stout, 1·5–5 in. long. *Panicles* many-branched, ferruginous-

puberulous, shorter than or as long as the leaves. *Petals* pubescent. *Fruit* narrowly ellipsoid, pointed at each end, glabrous, the pericarp thin, length 1·35 in., diam ·6 in., damson-colored when ripe. Miq. Flor. Ind. Bat. Suppl. 340; Clarke in Hook. fil. Flor. Br. Ind. II, 726; Hemsley in Hook. Ic. Plantar. t. 1549.

PAHANG; *Ridley* 2439. SELANGOR; *Curtis* 2340. SINGAPORE; *Ridley*; *Hullett*, 485, 888; *King*. PAHANG; *Ridley* 2662. MALACCA; *Griffith* (Kew Distrib.) 2702; *Maingay* 676. PERAK; *Scortechini*; *Wray*; *King's Collector* (many numbers), a very common plant. DISTRIB. Sumatra, *Forbes* 2207.

The structure of the seed is well explained by Mr. Hemsley in his description and figure in *Hooker's Icones Plantarum*.

3. HEPTAPLIURUM, Gærtn.

Large shrubs or trees, glabrous or tomentose, without prickles. *Leaves* digitate, rarely compound-digitate or 1-foliolate; leaflets coriaceous, entire or remotely toothed or lobed, never closely serrate nor ciliate, those near the panicle usually entire; stipules often connate within the petiole and prominent. *Umbels* (rarely capitate) panicled or in compound racemes; bracts woolly, deciduous or persistent; pedicels not jointed under the flower; bracteoles few or 0, or rarely densely tufted. *Calyx-margin* toothed or truncate. *Petals* 5–6 or many, valvate. *Stamens* as many as the petals. *Ovary* cells as many as the petals, disc small or large; styles small, separate or combined in a short conical narrow cylindric column. *Fruit* subglobose, 5–6-angled. *Seeds* compressed, albumen uniform. DISTRIB. Species 55, in the tropics of the Old World.

Leaves simple	1. *H. avene.*
Leaves all trifoliolate :—	
Panicle longer than the leaves, slender; its branches long, spreading, laxly-flowered	2. *H. luridum.*
Panicle shorter than the leaves; its branches short, densely-flowered	3. *H. triste.*
Leaves all digitately 5–9-foliolate :—	
Panicle simple or 2-branched, sub-racemose, only about 3 in. long; the lateral umbels subsessile, lax, few-flowered	4. *H. sub-racemosum.*
Panicle divided from the base or near it into several erect narrow branches 6–12 inches long; the lateral branches very short and bearing dense heads of subsessile flowers :—	
Ovary 8-celled, leaves glaucous and with loose wooly hairs beneath	5. *H. Cephalotes.*
Ovary 5-celled :—	
Both surfaces of the leaves quite glabrous ...	6. *H. Scortechinii.*
Lower surface of leaves tomentose	7. *H. tomentosum.*

Panicle with few narrow erect branches bearing shortly peduncled umbels of pedicellate flowers:—
- Ovary 12-celled; leaflets 5, membranous, 7–12 in. long ... ... 8. *H. Singalangense.*
- Ovary 9-celled; leaflets 7–9, very coriaceous, 3–5 in. long ... ... 9. *H. lati-foliolatum.*
- Ovary 5-celled:—
  - Main nerves of leaflets only 2 or 3 pairs, the basal prominent; reticulations rather wide, not prominent; panicles very narrow, covered, up to the bases of the pedicels, with minute stellate hair ... 10. *H. subulatum.*
  - Main nerves of leaflets 5 or 6 pairs, basal nerves prominent; panicles glabrous (rarely hairy) narrow in flower, spreading in fruit ... ... 11. *H. venulosum.*

Panicle with spreading branches:—
- Branches of the panicle umbellate:—
  - Ovary 5-celled; reticulations of leaves wide, distinct ... ... 12. *H. ellipticum.*
  - Ovary 6-celled:—
    - Common petiole 1–2·5 in. long; leaflets lanceolate or oblanceolate, caudate-acuminate, much narrowed to the base, 1·5–3·5 in. long; flower-buds globular, ·1 in. in diam.; fruit ·1 in. long ... 13. *H. scandens.*
    - Common petiole 2–4 in. long; leaflets ovate-lanceolate, shortly caudate-acuminate, the bases rounded, 2–4 in. long; flower-buds oblong, about ·2 in. long; fruit ·25 in. long ... ... 14. *H. affine.*
    - Common petiole 10–24 in. long; leaflets oblong-elliptic, shortly and abruptly acuminate, 4–12 in. long; flower-buds sub-globular, ·1 in. in diam.; fruit elliptic, ·25–·3 in. long ... ... 15. *H. Hullettii.*
    - Common petiole 5–10 in. long; leaflets oblong-elliptic or oblanceolate-oblong, acute, 5–10 in. long; flower-buds globular, ·15 in. in diam.; fruit ovoid, ·25 in. long ... ... 16. *H. Ridleyi.*
    - Common petiole 2–2·25 in. long; leaflets lanceolate, acute, narrowed to the base, 1·5–2·5 in. long; flower-buds oblong, ·2 in. long, fruit ·3 in. long ... 17. *H. nervosum.*
  - Branches of the panicle racemose ... ... 18. *H. Wrayi.*

Lower leaves large, digitately decompound:—
- Leaflets entire, narrowly oblong, acuminate, 2–3·5 in. long, panicle 8 in. long ... ... 19. *H. biternatum.*
- Leaflets usually entire, 2·5–7 in. long, panicle 10–15 in. long; fruit oblong ... ... 20. *H. heterophyllum.*

Leaves bipinnate, leaflets coarsely toothed; fruits sub-globular ... ... 21. *H. Curtisii.*

1. HEPTAPLEURUM AVENE, Seem. Rev. Hed. 43. Scandent; young branches with striate rugulose glabrous bark, brown when dry. *Leaves*

simple, coriaceous, narrowly oblong, acute, narrowed to the base, the edges slightly recurved; both surfaces glabrous, dull when dry; main nerves about 12 pairs, faint, sub-horizontal; length 3·5–5·25 in., breadth ·9–1·2 in.; petiole ·75–1·25, thickened near the apex. *Panicles* single or 2 or 3, terminal, puberulous, half as long as the leaves, erect; the few branches rather close together, about ·25 or ·3 in. long, each bearing 3–5 pedicellate flowers; the buds ·15 in., ovoid, their pedicels ·2 in. long; bracts lanceolate, deciduous. *Calyx-rim* narrow; petals, stamens and stigmas 6. *Fruit* ellipsoid, as large as a pea, sulcate. *Sciadophyllum avene*, Herb. Korthals.

Singapore; *Ridley* 5840, 6337. Distrib. Sumatra.

At once distinguished in the genus by its oblong simple leaves.

2. Heptapleurum luridum, new species. An epiphytic shrub 2–3 feet long; branches with rugulose glabrous bark. *Leaves* trifoliolate, with a common petiole 1–1·75 in. long, glabrous, fleshy when fresh, vertically rugose when dry; leaflets very coriaceous, narrowly elliptic-oblong, slightly oblique, tapering gradually to each end; the edges entire, much recurved when dry; both surfaces quite glabrous, the nerves and veins very indistinct even when dry; length 2·5–4 in., breadth ·5–·75 in.; petiolules unequal, thick, the lateral ·15–·25 in. long, the terminal about ·4 in. *Panicle* terminal, longer than the leaves; its branches few, slender, long, spreading, glabrous; the ultimate branchlets 1–1·5 in. long, bearing umbels of 3–8 broadly ovoid glabrous flowers ·1 in. long; their pedicels at first only about ·1 in. long, but two or three times as long in fruit. *Calyx-tube* shortly campanulate; its mouth truncate, entire. *Petals* completely united into a calyptra. *Stamens* 6, erect, the filaments short. *Styles* united into a short conical column; the stigmas 6, small, occupying the corners of its truncate apex.

Perak; *Scortechini* 1191; *King's Collector* 8304.

A very distinct small species easily recognised by its narrow very acuminate avenous leaflets borne on fleshy petioles, and by its slender spreading long-branched few-flowered panicles.

3. Heptapleurum triste, new species. A tree; young branches as thick as a swan's-quill, glabrous, pale when dry. *Leaves* 3-foliolate, the common petiole 1·5–2 in. long; leaflets thickly coriaceous, glabrous, broadly elliptic, blunt or shortly apiculate, the base rounded; the edges entire, boldly recurved when dry; main nerves 10 to 12 pairs, close together, indistinct on both surfaces; length 2·25–3·25 in., breadth 1·5–2 in.; petiolules unequal, the lateral pair ·5 in. long, the middle one ·8 in. *Panicle* terminal, shorter than the leaves, glabrous, divided from the base into 2 or 3 spreading branches, ebracteate; the branchlets about ·5 in. long (longer in fruit), each ending in an umbel of 10–20 ovate

flowers, ·15 in. long, their pedicels ·1 in. long. *Calyx-tube* campanulate; the limb truncate, narrow. *Petals* 5, broadly elliptic, blunt, reflexed. *Fruit* narrowly oblong, pointed, deeply 5-ridged, glabrous, crowned by the short conical style-column, ·2 in. long, glabrous.

Perak; on Ulu Batang Padong, at an elevation of about 4900 feet; *Wray* 1509.

A species near *H. ellipticum* but readily distinguished from that in the Herbarium by its dull broad coriaceous leaflets, more widely campanulate calyx-tube, and larger fruit.

4. Heptapleurum sub-racemosum, new species. A shrub 2–3 feet high; young branches with thick corky glabrous bark, pale when dry. *Leaves* trifoliolate or sometimes 5-foliolate, the common petiole 1·5–2·5 in. long, glabrous. *Leaflets* coriaceous, narrowly elliptic-lanceolate, caudate-acuminate, narrowed at the base, the edges entire and slightly revolute; both surfaces glabrous, distinctly and finely reticulate when dry; length 2·25–4 in., breadth ·75–1·1 in.; petiolules unequal, ·3–·4 in. long, that of the terminal leaflet ·8–1·25 in. long, thickened at the apex. *Panicle* solitary, terminal, very narrow, sub-racemose, 2-branched, only about 3 inches long and about ·65 in. across; the branchlets only ·1–·2 in. long, each ending in an umbel of 3–5 oblong, green flowers ·15 in. long; rim of *calyx* very narrow. *Fruit* oblong, ·2 in. long, glabrous, with 5 blunt ridges, pale green tipped with bluish, 5-celled.

Perak; *King's Collector* 8283.

Readily recognised by its small caudate-acuminate narrow leaflets, much and prominently reticulated when dry; and by its short narrow racemoid panicles.

5. Heptapleurum Cephatotes, Clarke in Flor. Br. Ind. II, 731. A large tree. *Leaves* digitate, their petioles rather slender, 1·5–3·5 in. long, glaucous; leaflets about 7, oblong-elliptic, the apex abruptly and shortly acuminate, the base rounded, the edges entire and slightly recurved when dry; upper surface shining, glabrous; the lower dull, glaucous, and bearing when young some quickly deciduous loose wooly hairs. *Panicle* minutely tomentose, terminal, consisting of numerous sub-erect branches 6–12 inches long, bearing shortly pedunculed globose ebracteolate dense capitula. *Fruit* oblong, ribbed, 8-celled, covered with stellate white tomentum and crowned by the broad cluster of short styles; disc large, spongy. *H. capitatum*, Seem. Rev. Hed. 15 (in part).

Malacca; *Griffith* (Kew Distrib.) 2700. Singapore; *Ridley* 3973, 6409. Penang; *Curtis* 837. Perak; *Wray* 1542; *Scortechini* 391.

6. Heptapleurum Scortechinii, new species. An epiphytic shrub, the young branches stout. *Leaves* digitate; the common petiole terete, glabrous, stout, 2·5–3·5 feet long; leaflets 8–10, very coriaceous, oblong

or oblong-elliptic, the apex blunt or shortly apiculate, the base rounded, the edges entire and recurved when dry; both surfaces quite glabrous, not reticulate; main nerves 6–9 pairs, slightly prominent on the lower surface; length 9–13 in., breadth 4–6 in.; petiolules unequal, 2·5–5 in. long. *Panicle* terminal, dividing into several narrow raceme-like branches, 10–20 inches long, covered with pale scurfy tomentum; the branchlets 40 or 50 in number and ·35 to ·75 in. long, each with a broadly ovate convolute wooly bract at its base, and at its apex a dense globular umbel of sub-globular flowers ·1 in. in diam. and borne on pedicels ·05 in. long. *Calyx* truncate, tapering to the base. *Petals* 6 or 7, narrowly lanceolate. *Stigmas* free, ovary 5-celled. *Fruit* unknown.

Perak; *Scortechini* 2008.

Collected only by the late Father Scortechini, whose specimens unfortunately are scanty and rather fragmentary. A very distinct species, in general appearance resembling *H. Cephototes*, Clarke and *H. rigidum*, Seem. The leaflets of the latter have however twice as many main lateral nerves, although their length is not greater.

7. Heptapleurum tomentosum, Hassk. in Cat. Hort. Bot. Bogor. (1844), p. 165. A half-scandent shrub, 6–8 in. high; the young branches stout, deciduously stellate-pubescent, the older glabrous. *Leaves* digitate; the common petiole 9–12 in. long, densely covered with rusty stellate tomentum, the intra-petiolar stipules about ·75 in. long. *Leaflets* 5–7, coriaceous, oblong-elliptic, caudate-acuminate, slightly narrowed to the base, the edges entire and slightly revolute; the upper surface boldly bullate and finely reticulate, quite glabrous, pale olivaceous when dry; the lower pale brown, more or less closely covered with pale brown stellate hairs; length 8–10 in., breadth 2·75–3·5 in.; petiolules unequal, 1·5–2·5 in. long, tomentose. *Panicles* usually two together, terminal, 4–5 in. long, racemose; the lateral branches about 12, short, ·2–4 in. long, each bearing a sub-globular umbel of 8–10, ovoid, blunt, glabrous flowers ·15 in. long; their pedicels ·1 in. long, pubescent. *Calyx-tube* funnel-shaped, the rim narrow. *Petals* 5, white, glabrous, calyptrate. *Stamens* longer than the petals. *Styles* 5, conjoined, papilliform, their apices free. *Fruit* ·2 in. long, narrowly oblong, 5-ridged, 5-celled. *Sciadophyllum tomentosum*, Blume Bijdr. 877; DC. Prod. IV, 260. *Paratropia tomentosa*, Miq. in Bonplandia for 1856, p. 138; Flor. Ind. Bat. I, Pt. I, 753; Ann. Mus. Lugd. Bat. I, 23.

Perak; *Scortechini*, *Wray* 2202, 3152; *King's Collector* 2066, 2216, 2569, 7253, 8733. Selangor; *Curtis* 2341. Distrib. Sumatra; *Forbes*. 2611.

I have seen no authentically-named specimen of this from the Leiden Herbarium, but the Perak plant agrees so completely with Miquel's description that I have no doubt of the correctness of my identification.

8. Heptapleurum Singalangense, Seem. Rev. Hed. 42. Scandent, glabrous. *Leaves* digitate; common petiole 12–15 in. long, stout; leaflets 5, membranous, elliptic, shortly acuminate, the base slightly narrowed, the edges with a few irregular remote teeth or entire; both surfaces glabrous, faintly reticulate; main nerves 7 or 8 pairs, curved, spreading; length 7–12 in., breadth 3·25–5·25 in., petiolules 1·25–2·5 in., thickened at the base. *Panicle* 12–18 in. long, covered with deciduous rusty stellate pubescence, very narrow, (about 2 in. wide); the branches numerous, about ·5 in. long, each ending in an umbel of 5–10 oblong obovoid pedicelled flowers ·25 in. long, their pedicels ·2–·3 in. long. *Calyx-tube* shortly campanulate, minutely scaly; its limb narrow, truncate, undulate. *Petals* 9, fleshy, narrow, slightly unequal, connate by their edges. *Stamens* 9. *Stigmas* united into a notched fleshy ring, ovary 12-celled. *Fruit* unknown. *Paratropia Singalense*, Miq. in Ann. Mus. Lugd. Bat. I, 23. *Agalma redivivum*, Seem. Rev. Hed. 25.

Perak; *Scortechini* 390; *Curtis* 3170.

The specimens which I have seen are few. In foliage they agree with the specimen in Kew named *Agalma redivivum*, which however Seemann describes as having 7–8-merous flowers. In other respects they agree with Seemann's description of that plant. They also agree with Miquel's full description of his *Paratropia Singalangense*, except as to the length of the petiole which Miquel gives as only 4–6 inches, a measurement so much out of proportion with those he gives for the petiolules, (1–2·5 in.) and leaflets, that I cannot help suspecting some clerical error.

9. Heptapleurum latifoliolatum, new species. A bush with stout branches. *Leaves* digitate; the common petiole stout, glabrous, somewhat compressed, 7–11 in. long; leaflets thickly coriaceous, ovate-rotund, shortly acuminate or blunt, the base rounded; the edges entire, slightly recurved when dry; both surfaces glabrous, the upper shining, the lower dull and sub-glaucous; main lateral nerves 7 or 8 pairs, spreading, curving upwards, prominent on the lower surface, depressed on the upper when dry; length 3–5 in., breadth 1·75–3·5 in.; petiolules ·8–1·5 in., rather stout. *Panicles* terminal, in pairs, 5–8 in. long, glabrous; the branches short, horizontal, each bearing at its apex an umbel of 10–15 pedicelled flowers; pedicels ·3 in. long. *Fruit* broadly ovoid, deeply 9-ridged, 9-celled, glabrous, crowned by the 9 very short free styles, and ·15 in. in diam., red when ripe.

Perak; on Gunong Babu at an elevation of about 5000 feet; *Wray* 3927.

10. Heptapleurum subulatum, Seem. Rev. Hed. 42. Scandent, glabrous. *Leaves* digitate; the common petiole 2–6 in. long, slender, glabrous, terete; leaflets coriaceous, oblong-elliptic or elliptic, shortly acuminate, tapering to the base; the edges entire, revolute when dry; both surfaces glabrous and reticulate but not prominently so, the upper

shining, the lower dull when dry; midrib prominent on the lower surface as also the 4 oblique, basal, and 2–3 pairs of sub-horizontal main nerves; length 2·5–7 in., breadth 1–3·5 in; petiolules unequal, ·2–2 in., swollen near the apex. *Panicle* terminal, stellately puberulous, shorter than the leaves while in flower, longer in fruit, bearing many very narrow racemoid branches each with an acuminate lanceolate bract 1 in. long at its base; branchlets very short, from ·15 in. when in flower to ·5 in. when in fruit, stellately puberulous, each bearing an umbel of 12–20 flowers; buds depressed, globular, glabrous, ·05 in. in diam.; their pedicels ·2 in. long, slender. *Fruit* rather broadly ovoid, bluntly 5-ridged, 5-celled, glabrous, ·15 in. long. Clarke in Flor. Br. Ind. II, 730. *Paratropia subulata*, Miq. in Ann. Mus. Lugd. Bat. I, 22.

Malacca; *Griffith* (Kew Distrib.) 2690; Maingay; 681, (Kew Distrib.) *Derry*. Pahang; *Ridley* 1632, 5818. Perak; *Scortechini; Wray* 872, 3090, 3639; *King's Collector* 773, 1102, 2343. Distrib. Sumatra.

This closely resembles *H. venulosum*, Seem., and is not always readily distinguishable from that species. The best marks of this appear to me to be the prominence of the basal nerves and the fewness of the other main nerves (only 2 or 3 pairs); and the longer narrower panicles which, up to the pedicels of the flowers, are covered with minute stellate hairs. The majority of the specimens of *H. venulosum*, Seem. have glabrous panicles, but those of var. *macrophylla* are hairy, and the leaves have many more lateral nerves.

11. Heptapleurum venulosum, Seem. Rev. Hed. 44. Scandent; young branches rather slender, glabrous. *Leaves* digitate; common petiole slender, terete, glabrous, 4–6 in. long; leaflets thinly coriaceous, oblanceolate-elliptic to oblong-lanceolate, shortly acuminate, narrowed to the base, the edges entire; both surfaces shining, glabrous, conspicuously and minutely reticulate; length 3–7 in., breadth 1·25–2·75 in.; petiolules unequal, slender, varying from ·5–1·5 in. long in the same leaf. *Panicle* varying in length but usually shorter than the leaves, terminal, glabrous or occasionally slightly pubescent, (stellate-pubescent in var. *macrophylla*), dividing into several narrow branches bearing short branchlets each terminating in an umbel of 10–15 depressed-globular flowers ·1 in. in diam.; their pedicels unequal, slender, ·15–·3 in. in length. *Fruit* ovoid, bluntly 5-ridged, 5-celled, glabrous, ·15 in. long, yellow when ripe. Clarke in Hook. fil. Flor. Br. Ind. II, 729; Brand. For. Flor. 294; Kurz For. Flor. I, 538. *Paratropia venulosa*, W. & A. Prodr. 377; Wight Ill. t. 118. *Hedera venosa*, Wall. Cat. 4923. *H. terebinthacea*, Wall. Cat. 4920, (partly,). *Aralia digitata*, Roxb. Hort. Beng. 22; Flor. Ind. II, 107.

Andaman Islands; *King's Collectors*. Malacca; *Derry*.

This species, so common from the base of the Eastern Himalaya southwards

through Assam to Burma, is replaced in the Malayan Peninsula by the closely allied species *H. ellipticum*, which differs from this as noted under that species. Mr. Clarke, in Flor. Br. India, however, reduces *H. ellipticum* to *H. venulosum*, a course in favour of which there is a good deal to be said.

12. HEPTAPLEURUM ELLIPTICUM, Seem. Rev. Hed. 43. Scandent; young branches with pale brown glabrous bark. *Leaves* digitate; the common petiole 4–6 in. long, glabrous; leaflets 5–7, coriaceous, more or less broadly elliptic, sometimes elliptic-rotund, apiculate, subapiculate or obtuse, the base rounded or sub-cuneate; the edges entire, revolute when dry; both surfaces glabrous and rather dull when dry; main nerves 4 or 5 pairs, the reticulations wide, inconspicuous; length 2·5–7 in., breadth 1·75–4 in.; petiolules uequal, ·75–1·5 in., that of the middle leaflet 2 in. *Panicle* about as long as the leaves, terminal, glabrous, lax, open, the branches long, spreading and bearing few-flowered umbels on long slender peduncles; flowers globular-ovoid, ·1 in. long or less, on slender pedicels ·15–·2 in. long. *Fruit* oblong, yellowish, with 5 ridges and 5 cells. *Paratropia elliptica*, Miq. in Bonplandia 1856, p. 138; Flor. Ind. Bat. I, Pt. I, p. 756; in Ann. Mus. Lugd. Bat. I, 20; *Sciadophyllum ellipticum*, Blume Bijdr. 878; DC. Prodr. IV, 260.

SINGAPORE; *Ridley* 5839, 6399. MALACCA; *Derry* 1187, 1215. PENANG; *Curtis* 972. PERAK; *Scortechini*; *Wray* 2020, 2136; *King's Collector* 2541, 4733, 10375, 10534. ANDAMAN AND NICOBAR ISLANDS; *King's Collector*.

This resembles *H. venulosum*, Seem, but the reticulations on the leaves of this are wider and less distinct than in that; and the panicles of this have spreading, quite glabrous, lax branches.

13. HEPTAPLEURUM SCANDENS, Seem. Rev. Hed. 43. A slender creeper 3–5 in. long, the stem pale and corky. *Leaves* small, digitate; common petiole 1–2·5 in. long, slender; leaflets 3–5, thinly coriaceous, lanceolate, caudate-acuminate, tapering much to the base, the edges entire and somewhat recurved; both surfaces glabrous, the upper smooth and shining, the lower dull and reticulate; length 1·5–3·5 in., breadth ·5–·8 in.; petiolules subequal, ·2–·25 in. long. *Panicles* longer than the leaves, slender, 4–8 in. long; the branches spreading horizontally, simple, each ending in an umbel of flowers on a slender pedicel nearly ·75 in. long; buds globular, ·1 in. in diam. *Fruit* elliptic, boldly 5-ridged, 5-celled, ·1 in. long. *Paratropia scandens*, Miq. in Bonplandia 1856, p. 138; Flor. Ind. Bat. I, Pt. I. 757. *P. brachybotrya*, Miq. Flor. Ind. Bat. I, Pt. I, 755. *Sciadophyllum scandens*, Blume Bijdr. 878.

PERAK; *Wray* 1844, 2401, 2880; *Curtis* 2687; *Scortechini* 218, 1352; *King's Collector* 4304. DISTRIB. Java, Sumatra.

A very slender glabrous species, at once distinguished by its small lanceolate, caudate-acuminate, digitate leaflets.

14. Heptapleurum affine, new species. A shrub 6–8 feet high, semi-scandent; young branches as thick as a goose-quill, shining, glabrous; common petiole 2–4 in. long, slender, the stipule bout ·65 in., both glabrous; leaflets 5 or 6, thinly coriaceous, ovate-lanceolate to elliptic, acuminate, the base sometimes narrowed but always rounded, the edges entire; length 2·25–4 in., breadth 1·25–1·75 in.; petiolules somewhat unequal, ·75–1·5 in. long. *Panicle* terminal, when young furfuraceously puberulous towards the base, ultimately quite glabrous everywhere, 2·5–5 in. long and almost as broad; the main branches 3 or 4, spreading and bearing, in pairs or whorls of 3, six to twelve ultimate ebracteate branches ·5–·75 in. long, each terminating in an umbel of 7–10 pedicellate broadly ovate flowers nearly ·2 in. long, the pedicels ·2 in. long. *Fruit* broadly ovate, apiculate, boldly 6-ridged, 6-celled, glabrous, nearly ·25 in. long.

Perak; at elevations of from 3000 to 5000 feet. *Scortechini* 333, 486; *King's Collector* 3827; *Wray* 4121.

This in many respects resembles *H. ellipticum*, but has larger flowers and its fruit is on shorter pedicels.

15. Heptapleurum Hullettii, new species. A small tree, 10–15 feet high; branches stout, rugulose, deciduously pubescent. *Leaves* large, digitate; the common petiole terete, glabrous, 10–24 in. long; leaflets 7–11, coriaceous, oblong or oblong-elliptic, occasionally somewhat broader in the upper than in the lower half, shortly and abruptly acuminate, slightly narrowed to the rounded base; both surfaces glabrous, not reticulate, the midrib prominent; main nerves 5–8 pairs, distant, slightly curved and ascending, prominent on the lower surface when dry, obsolete on the upper; length 4–12 in., breadth 1·5–3·25 in.; petiolules 1·25–3·5 in., slender, glabrous. *Panicles* 9–12 inches long, terminal, several together, long and narrow, with short horizontal slender branches from ·5 to 1 in. long, bearing terminal umbels of 8–12 small 6-merous sub-globular flowers ·1 in. in diam. *Fruit* elliptic, 6-ridged, 6-celled, crowned by the 6 short distinct styles, glabrous, pedicels ·25–·3 in. long.

Singapore; *Ridley* 447, 4591, 6012; *Wray* 2323; *King's Collector* 3048. Johore; *King* and *Hullett*.

A species resembling *H. dvaricata*, Miq.; but having leaflets with fewer nerves and no reticulations, much longer panicles and narrower fruit. It is allied also to *H. longifolium*, Seem., but the leaflets of that species have greatly more numerous main nerves, and the panicles are densely clothed with broad scale-like hairs and have longer lateral branchlets.

16. Heptapleurum Ridleyi, new species. Scandent; young branches stout, glabrous. *Leaves* digitate; common petiole terete, glabrous, 5–10 in. long; leaflets 5, very coriaceous, oblong, oblong-elliptic or oblanceolate-oblong, acute, slightly narrowed at the base; the edges

entire, very slightly revolute when dry; both surfaces glabrous, the reticulations faint when dry; main nerves very slightly prominent on the lower surface, about 8 pairs, spreading, the intermediate nerves almost as conspicuous; length 4–6·5 in., breadth ·2–2·75 in.; petiolules unequal, ·75–2·25 in. *Panicle* terminal, glabrous, 5 or 6 in. long, with several spreading branches; the branchlets few, about ·5 in. long, each bearing an umbel of 10–20 globular flowers ·15 in. in diam. *Calyx-tube* short, widely campanulate, the limb narrowed and truncate. *Petals* 5, elliptic, glabrous. *Fruit* ovoid, somewhat succulent, smooth, faintly 6-ridged, ·25 in. long, 6-celled.

Singapore; *Ridley* 6336 and perhaps also 1890*a*.

17. Heptapleurum nervosum, new species. A small shrub; branches with glabrous bark pale brown when dry. *Leaves* digitate; the common petiole terete, 2–2·25 in. long; leaflets 6, very coriaceous, lanceolate, acute, the base narrowed; the edges entire, much recurved when dry; both surfaces glabrous, the upper shining, the lower dull; main nerves 7–10 pairs, straight, sub-horizontal, very prominent on the lower surface and deeply impressed on the upper when dry, length 1·5–2·5 in., breadth ·5–·9 in.; petiolules unequal, the middle two about ·75 in. long, the others about half as long. *Panicle* terminal, from 1·5–2 in. long, rusty-puberulous at first, afterwards glabrous, branches about 2, spreading, with short bracteoles at the base and above it, each ending in an umbel of 8–10 oblong pedicelled glabrous flowers ·2 in. long, their pedicels ·1–·15 in. long. *Calyx-tube* cylindric-campanulate, the limb truncate and entire. *Petals* narrowly triangular. *Fruit* rotund-ovoid, boldly 6-ridged, 6-celled, glabrous, ·3 in. long.

Perak, on Gunong Chabong; *Scortechini*.

A very distinct small species with rather large flowers and fruit for the genus, and prominently-nerved very coriaceous leaflets.

18. Heptapleurum Wrayi, new species. A small tree; young branches as thick as a swan's quill, furfuraceous. *Leaves* digitate; common petiole 6–9 in. long, slender, glabrous; leaflets 7–9, thinly coriaceous, elliptic, abruptly shortly and sharply acuminate, the base rounded, the edges with shallow distant sharp serrations; upper surface glabrous, the lower glaucous and with scattered minute stellate hairy scales; main nerves 7 or 9 pairs, prominent beneath, length 3–5 in., breadth 1·75–2·25 in.; petiolules unequal, 1·5–2·5 in. long. *Panicle* terminal, longer than the leaves, furfuraceous stellate-pubescent, bearing a few rather distant, horizontal or deflexed many-flowered racemes. *Flowers* ·15 in. in diam., their pedicels ·2 in. long. *Calyx-tube* funnel-shaped, its mouth with 5 short triangular spreading teeth. *Petals* 5, elliptic-oblong, glabrous, reflexed. *Fruit* globular, prominently 5-ridged,

crowned by the long confuent column of styles, glabrous, 5-celled, ·15 in. in diam.

Perak; on Gunong Brumber Pahang, at an elevation of about 7000 feet, *Wray* 1585.

A very distinct species, at once distinguishable by its racemose panicles, and leaflets glaucous on the lower surface and with serrate edges.

19. Heptapleurum biternatum, Clarke in Hook. fil. Flor. Br. Ind. II, 735. A shrub several feet high; the young shoots and the under surfaces of the leaves deciduously stellate-pubescent. *Leaves* digitately decompound or twice pinnate, with ternate leaflets at each node of the rachis; leaflets coriaceous, narrowly-oblong, acuminate, entire, the base slightly narrowed and rounded; length 2–3·5 in., breadth ·5–·75 in., petiolules ·1 in. long or less, that of the terminal leaflet ·4 in.; both surfaces minutely reticulate and shining, the upper glabrous, the lower with deciduous stellate pubescence. *Panicle* 8 in. long, but only about 1·5 in. across; the branches little-divided, stellate-hairy; bracts deciduous, pedicels ·2 in. long.

Malacca; *Maingay* (Kew Distrib.) 684.

Known only by Maingay's fragmentary specimens.

20. Heptapleurum heterophyllum, Seem. Rev. Hed. 40. A bush or small tree 8–12 feet high. *Lower leaves* large, ternately decompound, 24 in. across; common petiole 12–24 in. long; the upper leaves smaller and only twice digitate; the leaflets in all 3 to 5 on each petiolule, thinly coriaceous, variable in shape, oblong-lanceolate to elliptic or broadly ovate, shortly acuminate, narrowed or rounded at the base; the edges entire, rarely with 1 or 2 teeth near the apex; both surfaces minutely reticulate and glabrous, the lower minutely dotted; length 2·5–7 or even 9 in., breadth 1–2·25 in.; petiolules of the lower leaflets ·1–·25 in., that of the terminal twice as long. *Panicles* with deciduous pale stellate pubescence, solitary or several together, 10–15 in. long, and only 1·5–2 in. across; the branches horizontal, slender, each ending in an umbel of flowers on slender pedicels, the flowers bearing fertile pistils smaller than those with fertile stamens. *Fruit* narrowly oblong, boldly 5-ribbed, glabrous, 5-celled, nearly ·25 in. long, claret-coloured when ripe. Clarke in Hook. fil. Flor. Br. Ind. II, 731. *Hedera heterophylla*, Wall. Cat. 4919; G. Don. Gen. Syst. III, 394. *Paratropia heterophylla*, Presl Epimel. Bot. 250; Miq. Flor. Ind. Bat. I, Pt. I, 761.

Penang; *Wallich*, *Curtis* 241, 2301 and possibly 1950. Perak; *Scortechini* 145, 664; *King's Collector* 718, 2688, 8640, 8769.

21. Heptapleurum Curtisii, new species. A large shrub. *Lower leaves* bipinnate, the upper trifoliolate; common petioles of both about 8 in. long; leaflets thinly coriaceous, oblong-elliptic, sometimes slightly

obovate, the apex shortly acuminate, the edges entire in the lower half but with a few unequal scanty coarse sharp teeth in the upper half; the base slightly narrowed, sometimes oblique; both surfaces quite glabrous, shining and finely reticulate when dry; length 3–6 in., breadth 1·5–2·5 in.; petiolules unequal, the lateral ·1 in. long or absent, the terminal ·35–·8 in. *Panicle* terminal, shorter than the leaf-petioles, with several rusty stellate-tomentose bracts ·75 in. long at its base, 2-branched; the branches narrow, sparsely covered with scurfy pubescence; the lateral branchlets about ·75 in. long, slender, each bearing at its apex a crowded umbel of from 10–20 oblong flowers on pedicels ·15–·3 in. long. *Fruit* oblong, boldly 5-ribbed, crowned by the conical disc bearing 5 small rounded stigmas at its corners, 5-celled.

Penang; at Pulo Bœtong, 1950.

I have seen only two specimens (and they are both of the same gathering) of this very distinct species.

4. Trevesia, Vis.

Shrubs or small trees, prickly or unarmed, glabrous or stellate-hairy. *Leaves* palmifid or palmisect; petioles often united by a wing at their base; stipules united within the petiole, or obsolete. *Flowers* polygamous, large for the Order; umbels panicled; pedicels not jointed under the flower; bracts small or 0. *Calyx-margin* entire or toothed. *Petals* 8–12, valvate, somewhat thick, often cohering as a cap in the fertile flowers. *Stamens* equal in number to the petals. *Ovary* with as many cells as the petals; styles connate into a short column. *Fruit* ovoid, large for the Order. *Seeds* compressed; albumen uniform. Distrib. Species about 10; natives of Eastern India, Malaya and Polynesia.

Trevesia palmata, Vis. in Mem. Acad. Torino, Ser. 2, IV, 262, *with fig.* A small single-stemmed tree 10–25 feet high; young shoots ferruginous-pubescent and very prickly. *Leaves* coriaceous, large (12–24 in. in diam.), rotund in general outline, deeply palmatifid; or, in young shoots, palmatisect, widely cordate at the base, the lobes acuminate, their edges serrate or sometimes lobulate; glabrous when adult or with a few small rufous stellate hairs on the lower surface; the lobules contracted in the middle to a pseudo-petiolule (in var. *cheirantha*); petiole often prickly, 6 to 20 in. long. *Panicles* 12–30 in. long, the branches spreading, when young clothed with reddish-brown tomentum; bracts oblong, 1 in. long, usually deciduous; pedicels 1–1·5 in. long. *Flower-buds* ·12 in. in diam. *Fruit* ovoid-rotund, the ribs not prominent, crowned by the stout style, fleshy, ·5 in. in diam. Seem. Rev. Hed. 77; Kurz For. Flora Burma, I, 539; Clarke in Flor. Br. Ind. II, 732; Bœrlage in Ann.

Jard. Bot. Buitenzorg VI, 108. *Gastonia palmata*, Roxb. Hort. Beng. 33; Flor. Ind. II, 407; Lindl. in Bot. Reg. t. 894. *Gilibertia palmata*, DC. Prodr. IV, 256. *Hedera ferruginea and H. palmata*, Wall. Cat. 4909 and 4910 (partly). *Brassaiopsis confluens*, Seem. Rev. Hed. 18 (*as to the leaves*). *Aralia dubia*, Spreng. Syst. Veg. IV, 2, p. 125.

Perak; *Scortechini; King's Collector* 4435, 6715.

Var. *cheirantha*, Clarke in Flor. Br. Ind. II, 732; laminæ of the lobes cut away in the middle so as to expose the midrib and form a pseudo-petiolule. *Hedera? cheirantha*, Jack in Wall. Cat. 4925; Wall. Cat. 4910 *in part.*

Perak; *Wray* 2322; *King's Collector* 2308; *Scortechini* 344.

5. Dendropanax, Decne and Planch.

Unarmed glabrous trees or shrubs. *Leaves* simple, entire, (palmately 3–5-lobed on young shoots). *Umbels* solitary or in small panicles; bracts small or none; pedicels not jointed under the flower. Limb of the calyx entire or 5-toothed. *Petals* 5, free, valvate, rather thick. *Stamens* 5. *Styles* united into a column at the base, free at the apex. *Fruit* globose or ellipsoid, succulent, distinctly or obscurely 5-ribbed. *Seeds* compressed; albumen uniform. Distrib. about 12 species mostly tropical American; one Japanese; one Indo-Chinese.

Dendropanax Maingayi, new species. A shrub; young branches with corky bark, pale-brown when dry, all parts except the umbels glabrous. *Leaves* alternate or sub-opposite, thinly coriaceous, oblong-ovate, oblong or lanceolate, acute; the base rounded, sometimes slightly narrowed; the edges entire and slightly recurved when dry; both surfaces glabrous, dull, the midrib prominent on the lower and sending off near its base two bold curving nerves running at some distance from the margin to the apex and, above the origin of these, 7–8 pairs of faint horizontal nerves; length 2–3·25 in., breadth 1–1·75 in., petioles varying from ·25–1·5 in. in length. *Umbel* simple, terminal, its pedicel ·35–·5 in. long; flowers 8–12, oblong, pedicelled, ·2 in. long, their pedicels ·25–·4 in. long. *Calyx* cylindric-campanulate, puberulous, its mouth with 5 sharp triangular teeth. *Petals* broadly lanceolate, acute, quite free. *Fruit* globular, succulent, glabrous, ·3 in. in diam. *D. parviflorum*, Clarke in Hook. fil. Flor. Br. Ind. (*not of Bentham*).

Malacca; *Maingay* (Kew Distrib.) 682; *Griffith* 2685-1. Perak; *Scortechini* 308.

This *Dendropanax*, found in Malacca and Perak, does not agree with specimens of *D. parviflorum*, Benth., collected in Hongkong. It appears to me to be a distinct species hitherto un-named.

6. Arthrophyllum, Blume.

Shrubs or small trees, unarmed. *Leaves* glabrous or sub-glabrous, the lower large and compoundly pinnate, the uppermost opposite and simple, the intermediate 3-foliolate; leaflets easily separable from the rachis; stipules forming a ligule within the petiole. *Inflorescence* a terminal compound umbel, the terminal umbellules peduncled; bracts very small; pedicel not jointed under the flower. *Calyx-teeth* 5, small. *Petals* 5, valvate. *Stamens* 5. *Ovary* 1-celled, 1-ovuled; style short, simple. *Fruit* (in the Indian species) ovoid, not angular. *Seed* sub-globose; albumen ruminate. Distrib. Species 3, Malayan.

The 1-celled ovary is anomalous in this Order, and this genus was excluded from *Araliaciæ* by Seemann.

Lower leaves pinnately decompound ... ... 1. *A. diversifolium.*
Lower leaves simply pinnate, or at most bipinnate .. 2. *A. pinnatum.*

1. Arthrophyllum diversifolium, Blume Bijdr. 879. A shrub or small tree, all parts except the umbels glabrous. Lower leaves large, pinnately decompound, with pairs of opposite leaflets at the main divisions, the upper leaves smaller and simply pinnate, and the uppermost of all trifoliolate or simple; leaflets coriaceous, oblong or elliptic, acute, narrowed at the base, entire; length 1·5–3 in., breadth 1·25–2·25 in.; petiolules ·25–·45 in., slender. *Inflorescence* a compound umbel; the peduncles of the ultimate umbels unequal, covered with warm brown deciduous stellate tomentum; lengthening in fruit to ·5–1·5 in.; pedicels ·25 in. long; *fruit* ovoid-globose, not ridged, crowned by the conical disc, glabrous. Clarke in Hook. fil. Flor. Br. Ind. II, 734; Miq. Flor. Ind. Bat. I, Pt. I, 767. *A. javanicum*, Blume Bijdr. 879; DC. Prodr. IV, 266; Kurz For. Flor. I, 540. *A. ellipticum*, Blume and DC. l. c. *A. Blumeanum*, Zoll. & Mor. Verz. 41; Miq. l. c. 1, 768. *A. ovalifolium*, Jungh. & De Vriese in Miq. l. c. t. 14. *Panax polycarpum*, Wall. Cat. 4930. *P. Jackianum*, Wall. Cat. 4931. *Hedera Jackiana*, G. Don Gen. Syst. III, 394. *H.? ovata*, Wall. Cat. 4911. *Eupteron, sp. nov.* Kurz Andam. Rep. Suppl. B 9.

Malacca; *Griffith* (Kew Distrib. 2675). Singapore; *Anderson* 48, 185; *Hullett* 351, 393; *Ridley*, 5838. Penang; *Curtis* 781. Perak; *Wray* 2012, 3063; *King's Collector* and *Scortechini*, many numbers. Andaman Islands; *Kurz*.

2. Arthrophyllum pinnatum, Clarke in Hook. fil. Flor. Br. Ind. II, 734. A bush; all parts glabrous. *Leaves* pinnate, rarely bipinnate or simple; the pinnate ones 12–18 in. long and with 5–17 leaflets; leaflets varying in size, coriaceous, lanceolate, caudate-acuminate, tapering to the base; the edges entire, glabrous; length 1·25–4 in., breadth ·4–1 in., petiolule absent or only ·1 in. in length. *Umbels* with few

umbellules, their peduncles 1·5–2 in. long; pedicels glabrous or with rusty stellate deciduous pubescence; fruit sub-globose, shining, ·15 in. in diam. *Panax pinnatum*, Lamk. Dict. II, 715; DC. Prodr. IV, 254; Wall. Cat. 9057. *P. secunda*, Schultz Syst. VI, 215. *Nothopanax? pinnatum*, Miq. Flor. Ind. Bat. I, Pt. I, 766.

Penang; *Wallich*, *Maingay* (Kew Distrib.) 679. Malacca; *Maingay* 677; *Griffith* (Kew Distrib.) 2676; *Ridley* 3224. Perak; *Wray* 330, 1475; *Scortechini* 352.

7. Wardenia, new genus.

A miniature tree with prickly stem, otherwise unarmed. *Leaves* coriaceous, simple, on long terete petioles expanded at the base into a short sheath with 2 minute stipules on its inner surface. *Inflorescence* a terminal shortly-branched compound umbel. *Flowers* hermaphrodite. *Calyx-tube* narrowly campanulate, its limb with 5, small, spreading teeth. *Petals* 5, calyptrate, their edges slightly infolded, valvate below, slightly imbricate near the apex; the midribs prominent on the inner surface. *Stamens* 5, alternate with the petals; the filaments short, straight; the *anthers* versatile; the cells linear, quite separate from each other, each united by its middle to the tip of the filament. *Disc* large, fleshy, convex, covering the whole of the apex of the ovary, slightly 5-lobed. *Styles* united to form a short thick column without any distinct stigmatic enlargement; ovary 1-celled, with 2 parallel pendulous ovules. *Fruit* 2-celled, by the formation of a dissepiment not present in the ovary, 2-seeded; *seeds* compressed. A single species.

This genus is allied to *Arthrophyllum*; but its ovaries, although one-celled, have two pendulous ovules. The fruit, however, is two-celled, by the subsequent formation of a dissepiment, and is 2-seeded. The leaves moreover are all simple. The seeds of the few specimens which I have seen are quite young and the nature of the albumen cannot be made out. I have named the genus in honour of my friend Brigade-Surgeon Lt.-Colonel C. J. H. Warden, a distinguished pharmacologist and one of the authors of the *Pharmacographia Indica*.

Wardenia simplex, King. A shrub 6–8 in. high, deciduously rufous-pubescent towards the apex, prickly near the base. *Leaves* simple, elliptic, tapering gradually to the shortly acuminate apex, not narrowed to the slightly cordate base; both surfaces bearing minute scattered rusty stellate hairs; length 8–15 in., breadth 3·5–7 in., petiole 5–10 in. *Flower* buds ·1 in. in diam., conical; pedicels ·6–·9 in. long, slender, rusty-pubescent, the umbels 10–20-flowered. *Calyx* slightly rusty-pubescent. *Petals* glabrous. *Fruit* elliptic-globose, subglabrous, ·2 in. long, crowned by the calyx and by the slender conic stylar column.

Perak; near Ulu Kerling, *King's Collector* in flower during March; only once collected.

8. Heteropanax, Seem.

A small unarmed tree. *Leaves* glabrous or nearly so, very large, pinnately decompound, stipules not prominent. *Panicles* large, the branches bearing umbels, stellate-hairy; bracts of umbels small, ovate, obtuse, persistent; pedicels not jointed to the flowers. *Flowers* polygamous, the female flowers most numerous in the terminal umbel. *Calyx-limb* minutely toothed. *Petals* 5, valvate. *Stamens* 5, filaments filiform, anthers ovate. *Disk* nearly flat; ovary 2-celled; styles 2, slender, free from the base, spreading, the stigmas sub-terminal. *Fruit* laterally compressed, coriaceous, almost didymous, 2-seeded. *Seeds* compressed, albumen ruminate. Species 1 or 2; Indo-Chinese.

Heteropanax fragrans, Seem. Rev. Hed. 73. A tree 40–60 feet high; all parts glabrous. *Leaves* large, the lower often 3 feet across, pinnately decompound, the pinnae with a pair of opposite leaflets at their forks; leaflets ovate or ovate-oblong, acute or acuminate; the base slightly oblique, not narrowed; variable in size (2·5–5 in. long, and 1·5–2·5 in. broad); petiolules of lateral leaflets ·1–·2 in. long, that of the terminal one ·8–1 in. *Panicles* terminal, longer than the leaves; *flowers* small, whitish-tomentose, in small condensed umbels, their pedicels under ·25 in. long; *fruit* compressed, sub-reniform, sub-glabrous, slightly glaucous, ·35 in. across. Brandis For. Flora 249; Kurz For. Flora Burma, I, 541; Clarke in Hook. fil. Flor. Br. Ind. II, 734. *Panax fragrans*, Roxb. Hort. Beng. 21; Flor. Ind. II, 76; Wall. Cat. 4929; DC. Prodr. IV, 254 (*excl. syn. of Don*).

Andaman Islands; *King's Collector*. Distrib. Brit. India, Java, China.

9. Brassaiopsis, Decne. & Planch.

Large shrubs or trees, glabrous or tomentose, armed or not. *Leaves* digitate or palmate or angled; stipules connate within the petiole, not prominent. *Umbels* in large compound panicles, young parts at least stellately tomentose; bracts not large, often persistent; pedicels rising from a dense cluster of persistent bracteoles, not jointed under the often polygamous flowers. *Calyx* 5-toothed. *Petals* 5, valvate. *Stamens* 5. *Ovary* 2-celled; styles 2, united, long or short. *Fruit* broadly globose or turbinate, 2- or (by abortion) 1-seeded. *Seed* not compressed; albumen ruminated. Distrib. Species 11; Northern Brit. India to Java.

Brassaiopsis palmata, Kurz in Journ. As. Soc. Beng. XXXIX,

(1870) Pt. II, 77. A small sparingly prickly tree with simple stem slightly branched near the top; young shoots covered with tawny or rusty scurfy tomentum. *Leaves* crowded at the ends of the stem and branches, large, 9–15 in. across, coriaceous, rotund in general outline, cordate at the base, palmately lobed about half or more than half way down; the lobes 5–9, oblong, or sometimes sinuate towards the base, acuminate, serrate; upper surface glabrous, lower sub-glabrous; the petiole 10–20 in. long, without prickles, scurfy-tomentose when young, ultimately glabrous. *Inflorescence* rusty-tomentose, terminal, panicled, the ultimate branches bearing many-flowered bracteolate umbels; flowers ·15 in. across, their pedicels ·5–·7 in. long; rim of calyx narrow, irregularly toothed. *Fruit* broadly elliptic or turbinate, terete, ·3 in. long, as large as a pea, crowned by the slender column of connate styles; cocci 1 or 2, with chartaceous pericarp, 1-seeded. Kurz For. Flor. Burma I, 537; Clarke in Hook. fil. Flor. Br. Ind. II, 735. *Panax palmatum*, Roxb. Hort. Beng. 21; Flor. Ind. II, 74. *Hedera polycantha*, Wall. Pl. As. Rar. II, t. 190; Cat. 4907 B.

This species is closely allied to *B. Hainla*, Seem., from which it differs chiefly in having leaves with deeper narrower more serrate lobes, and also in having rusty instead of pale tomentum on the young shoots and inflorescence. The two are in my opinion rather too closely allied to be kept distinct as species. In his distribution, Wallich issued both under the name *Hedera polycantha* and the number 4907.

Perak; *Scortechini* 17, 146; *Ridley* 3018; *King's Collector* 2598. Distrib. Brit. India, along the base of the Himalaya; Assam and Burma.

Var. *andamanica*, lobes of leaves obovate-oblong, the edges almost entire; inflorescence a narrow panicle nearly as long as the leaves. *Araliopsis andamanica*, Kurz in Andaman Report, App. B, 9.

Andaman Islands; *Kurz, King's Collectors.*

10. Hederopsis, C. B. Clarke.

A glabrous unarmed tree. *Leaves* 1–3-foliolate; leaflets lanceolate, denticulate or nearly entire; base of petiole much dilated; stipules inconspicuous. *Umbels* panicled; bracts and bracteoles deciduous; pedicels jointed close under the flowers. *Calyx* margined, somewhat prominently 5-toothed. *Petals* 5, valvate. *Stamens* 5. *Ovary* 5-celled; styles connate. *Fruit* berried, large, sub-globose, crowned by the stout persistent style. *Seeds* 5–4; albumen ruminated.

Hederopsis Maingayi, Clarke in Hook. fil. Flor. Br. India, II, 739. Leaflets of the compound leaves membranous, ovate-lanceolate, acuminate, narrowed at the base, nerves faint, length 3–5 in., breadth 1·5–2

in., petiolules ·1–·2 in. Simple leaves as long as 8·5 in. and about 4 in. broad; petiole 1–2 inches. *Inflorescence* a panicle of umbels with puberulous peduncles 1 in. or more long. *Calyx-tube* sub-globular, puberulous. *Petals* ovate-lanceolate, spreading, ·15 in. long. *Fruit* (unripe) more than ·5 in. long, including the conical disc and persistent style.

Malacca; *Maingay* (Kew Distrib.) 683.

This plant has not been collected since Maingay's time, and it is known only from his fragmentary specimens.

11. Tupidanthus, H. f. & T.

A large glabrous shrub, at first erect but afterwards a lofty climber. *Leaves* digitate; leaflets glabrous, leathery, entire; stipules connate within the petiole. *Inflorescence* a compound umbel or small panicle; pedicels thick, not jointed under the flowers. *Calyx-margin* obsolete. *Petals* closely connate, falling off in a cap. *Stamens* very many, in two or several series. *Ovarian* cells and stigmas very numerous; the latter sessile, radiating, crowded but not connate. *Fruit* globose, depressed, succulent.

Tupidanthus calyptratus, Hook. fil. and Thoms. in Bot. Mag. t. 4908. *Leaflets* 7–9, oblong or oblong-obovate, acute or blunt, 4–7 in. long, and 1·75–3·5 in. broad, the petiolules 1–2 in.; the common petiole 6–15 in. *Inflorescence* umbellate, 3–4-branched; the branches stout, short and with large coriaceous bracts at their bases; the ultimate umbels with 3–7 pedicellate flowers nearly 1 in. across; calyx-tube glabrous, thickly coriaceous. *Stamens* 50–70, crowded. *Fruit* sub-globose, succulent, 1·25–1·5 in. in diam. when ripe. Seem. Rev. Hed. 6; Clarke in Hook. fil. Flor.Br. Ind. II, 740.

Perak; on Gunong Ulu Sungei, elevat. 4500 feet; *Wray* 1594. Distrib. Burma; Khasia Hills and probably Java.

Mr. Wray's specimens were collected at an elevation much higher than this species ever ascends to in British India. They have smaller leaves with blunt leaflets, but are otherwise indistinguishable from the British Indian plant.

From the Journal, Asiatic Society of Bengal, Vol. LXIX. Part II, No. 1, 1900.

I.—*Materials for a Flora of the Malayan Peninsula.*—*By* Sir George King, K.C.I.E., M.B., LL.D., F.R.S., &c., *late Superintendent of the Royal Botanic Garden, Calcutta.*

No. 11.

After about two years of unavoidable delay, I am now able to offer to the Society a further contribution towards the completion of these *Materials*. The paper now submitted gives an account of the natural order which, in the sequence hitherto followed, falls to be numbered XLVII. An account of the family *Myrtaceæ* which ought, according to that sequence, to have immediately preceded this one of *Melastomaceæ* is now in preparation, and will I hope before long be ready for presentation to the Society. The present paper is not entirely my own work, the account of the genus *Sonerila* having been most kindly prepared for me by Dr. O. Stapf, First Assistant in the Royal Herbarium, Kew, whose contributions to the Botany of Borneo, published by the Linnean Society of London, have already marked him as an authority on the Malayan Flora.

Order XLVII. MELASTOMACEÆ.

Herbs or shrubs, more rarely trees or climbers. *Leaves* opposite or rarely whorled, generally petioled, entire or nearly so, often palmately 3–5–7-nerved from near the base to the apex (mostly pinnate-veined in *Memecylon*); stipules 0. *Flowers* spiked, panicled or cymose,

rarely solitary or fascicled, regular, hermaphrodite. *Calyx-tube* united by vertical walls to the ovary, rarely nearly free; limb usually 4–5- (sometimes 3- or 6-)lobed, or truncate, rarely falling off in a cap. *Petals* as many as the calyx-lobes, contorted in bud, inserted on the margin of the calyx-limb. *Stamens* as many as or more than (frequently twice as many as) the petals, inserted with them; alternate stamens often shorter, sometimes rudimentary, filaments bent inwards in the bud; anthers opening at the summit by one or two pores, rarely by slits down the face; connective often appendaged near the base by bristles, tubercles or a spur. *Ovary* 4–5- (rarely 3- or 6-)celled (in *Memecylon* 1-celled); style simple, filiform, rarely short; ovules very many (except in *Memecylon*); placentas axile, parietal or free central. *Fruit* included in the calyx-tube, capsular or berried, breaking up irregularly or by slits through the top of its cells. *Seeds* minute, very many (in *Memecylon* one only); albumen 0; cotyledons short (or in some of the *Memecyleæ* long, thin and convolute).—Distrib. Species about 2700, tropical, with a few subtropical; mostly in America, but many in south-east Asia, and a few in Africa and Polynesia.

Suborder 1. Melastomeæ. *Ovary* 3-6-celled. *Ovules* very many, on placentas radiating from the axis. *Seeds* very many. *Anthers* opening by a single terminal pore (rarely by 2).

Tribe I. Osbeckieæ. *Seeds* curved through half a circle, minutely punctate.

Stamens all nearly alike. Fruit a berry ... ... 1. Otanthera.
Stamens very unequal ... ... 2. Melastoma.

Tribe II. Oxysporeæ. *Seeds* straight, oblong or cuneate, raphe often excurrent. *Ovary* with the vertex usually free, conical. *Petals* more than 3. *Inflorescence* not scorpioid. *Fruit* capsular.

* *Inflorescence terminal* (*see also* Ochthocharis).

Panicles broad, often coloured ... ... 3. Oxyspora.
Panicles narrow. Flowers minute ... ... 4. Allomorphia.

** *Inflorescence axillary, stamens equal, flowers minute.*

Stamens 4 ... ... 5. Blastus.
Stamens 10 ... ... 6. Ochthocharis.
Stamens 8 ... ... 7. Anerincleistus.

Tribe III. Sonerileæ. *Seeds* straight, oblong or cuneate, often angular, raphe sometimes excurrent. *Ovary* flattened or depressed at the vertex. *Fruit* capsular.

Petals 3. Inflorescence scorpioid ... ... 8. Sonerila.
Petals 4. Flowers in a long-peduncled head ... 9. Phyllagathis.

Tribe IV. Medinilleæ. *Seeds* straight, cuneate or obovate, often angular. *Connective* often appendaged near the base. *Fruit* baccate.

* *Longer stamens having two long bristles attached to the base of the connective in front.*

Cymes lateral ... ... 10. Marumia.
Panicles terminal ... ... 11. Dissochæta.

** *Longer stamens having the connective at base variously appendaged but not with two long bristles in front (equal and with two short bristles in one species.)*

Four vertical plates on the ovary ... ... 12. ANPLECTRUM.

*** *Stamens equal or nearly so.*

Connective not at all or very shortly produced at the base, but having 2 tubercles in front and a spur behind ... 13. MEDINILLA.

Anthers not produced at the base; connective with tufted beard at the base behind but not spurred ... ... 14. POGONANTHERA.

Connective not produced at the base and with no appendages in front, but minutely spurred behind, not bearded ... ... 15. PACHYCENTRIA.

SUBORDER II. ASTRONIEÆ. *Ovary* 4–5-celled; ovules very many on parietal nearly basal placentas. *Seeds* very many. *Anthers* short, opening by slits. *Fruit* baccate.

Calyx-tube smooth. Panicles terminal ... ... 16. ASTRONIA.

Calyx-tube verrucose. Cymes small ... ... 17. PTERNANDRA.

SUBORDER III. MEMECYLEÆ. *Ovary* 1-celled; ovules about 9 on a basal short free-central placenta. *Stamens* equal; anthers short, opening by pores or short slits. *Berry* 1-seeded.—*Leaves* usually pinnate-nerved.

Stamens 8 ... ... 18. MEMECYLON.

1. OTANTHERA, Blume.

Slender shrubs. *Leaves* membranous, entire, 3–5-nerved. *Panicles* terminal or sub-terminal, lax, cymose, few-flowered. *Calyx* bearing on its ovoid tube simple or tufted bristles, rarely glabrous, the lobes 5 or 6, equal to or shorter than the tube, deciduous. *Petals* 5–6, obovate, the apex rounded or acute. *Stamens* subequal, 10–12; anthers opening by a terminal pore, not beaked, the connective not produced at the base, or slightly biauriculate in front. *Ovary* half-inferior, with 5 or 6 bristles at its apex, 5–6-celled; style filiform, simple; ovules numerous on axile placentas. *Fruit* 5–6-celled, baccate. *Seeds* small, curved, punctate. DISTRIB. Species 7 or 8; Malaya, Burma, Philippines, N. Australia.

Calyx-tube bearing simple bristles ... ... 1. *O. celebica.*

Calyx-tube quite glabrous ... ... 2. *O. nicobarensis.*

1. OTANTHERA CELEBICA, Blume, Mus. Bot. Lugd. Bat. I, 56. *Leaves* narrowly elliptic, shortly acuminate: upper surface sparsely strigose, the nerves glabrous, lower usually glabrous, the main nerves (and sometimes the minor also) with sub-adpressed bristles: length 2·25–3·5 in., breadth ·5–1·5 in., petioles ·2–·4 in. long. *Calyx-tube* with simple acuminate bristles often bulbous at the base, the teeth setose. Naud., Ann. Sc. Nat. Ser. 3, XIII, 353; Cogn. in DC. Mon. Phan. VII, 342.

Andaman Islands; common, *King's Collectors.* Distrib. Celebes.

2. Otanthera nicobarensis, Teysm. et Binn. Pl. Nov. Hort. Bogor. 29. *Leaves* lanceolate or oblong-ovate, acuminate, upper surface sparsely strigose, the nerves glabrous; lower glabrous except the strigose nerves; length 3 to 4·5 in., breadth 1·25 to 2 in., petioles ·5 to 1 in. *Calyx-tube* quite glabrous; the teeth sub-ciliate. C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 522; Kurz, Journ. As. Soc. Bengal, 1876, pt. II, 131; Cogn. in DC. Mon. Phan. VII, 342.

Nicobar Islands; *Novara Expedition.*

This has been collected only by the botanists of the Austrian expedition. It is the only species of the genus with a glabrous calyx.

2. Melastoma, Linn.

Scaly, strigose or villous shrubs. *Leaves* petioled, oblong or lanceolate, entire, 3–7-nerved. *Flowers* terminal, solitary, clustered or panicled, rose or purple, 5- (rarely 6–7-) merous. *Calyx-tube* ovoid or campanulate, with simple (rarely with penicillate) hairs, lobes deciduous. *Petals* equal in number to the calyx-lobes. *Stamens* twice as many as the petals, very unequal, alternate longer ones with purple anthers having the connective long-produced at the base and terminating in two lobes, the shorter ones having yellow anthers, the connective not produced but with two tubercles in front. *Ovary* ovoid, more or less united to the calyx-tube, 5- (rarely 6–7-) celled, apex bearing bristles; style filiform, simple; ovules very numerous, placentas axile. *Fruit* berried, succulent or coriaceous, enveloped in the calyx-tube, bursting irregularly. *Seeds* minute, very many, curved through half a circle, minutely punctate.—Distrib. Species 40; Asia, North Australia and Polynesia.

Calyx-tube densely covered with long, flexuose, spreading, shining, coloured bristly hairs ·25 to ·5 in. long; young branches, petioles, and pedicels with stiff spreading bristles; flowers 2 to 3 in. in diam.	1. *M. decemfidum.*
Calyx-tube, young branches, petioles and pedicels with adpressed, lanceolate acuminate, serrulate scales: cymes condensed, flowers 1·25 in. across	2. *M. imbricatum.*
Calyx-tube densely clothed with linear acuminate, entire or serrate scales, those of the young branches, petioles and pedicels shorter and broader; corymbs with deciduous (often large) bracts; flowers 2 to 3 in. across (only 1·25 in var. *perakensis*)	3. *M. malabathricum.*

1. Melastoma decemfidum, Roxb. Hort. Beng. 90; Fl. Ind. II, 406. A shrub, 5 to 10 feet high; young branches at the nodes and near the tips, petioles and pedicels with numerous stiff, spreading bristles. *Leaves* narrowly-lanceolate or oblong-lanceolate, acuminate, 3- to 5-nerved; the upper surface smooth except for a few scattered

adpressed hairs, the lower glabrous, glandular-punctate; length 2·5 to 5 in., breadth ·6 to 1·8 in.; petiole ·25 to ·5 in. long. *Flowers* solitary or two or three together, bright purple, 2 to 3 in. in diam., the bracts few, short, acuminate; pedicels under ·5 in. *Calyx-tube* densely covered with long, flexuose, shining, coloured, bristly hairs; ·25 to ·5 in. long, the teeth rather shorter than the tube, ovate-lanceolate, acuminate, glabrous inside, deciduous. *Fruit* ·75 in. in diam., truncate at the apex, ovoid to ovoid-globular, ·5 in. in diam. Jack in Trans. Linn. Soc. XIV, (1822) 6; DC. Prodr. III, 146; Naud., Ann. Sc. Nat. Ser. 3, XIII, 282; Bl. Mus. Bot. I, 55; Cogn. in DC. Mon. Phan. VII, 345. *M. sanguineum*, Sims in Bot. Mag. t. 2241; DC. Prodr. III, 145; Don in Mem. Wern. Soc. IV, 289; Miq. Fl. Ind. Bat. I, pt. I, 504; Naud. l.c. 281; Triana in Trans. Linn. Soc. 60; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 524; Hemsl. in Jour. Linn. Soc. XXIII, 300. *M. malabathrica*, Sims in Bot. Mag. (not of Linn.) 529. *M. Gaudichaudianum*, Naud. l.c. 278. *M. macrocarpum*, Naud. l.c. 281 (not of Don). *M. porphyreum*, Bipp. et Bl. in Flora 1831, II, 487. *M. pedicellatum*, Naud. l.c. 280; Cogn. in DC. Mon. Phan. VII, 346.

Penang; *Wallich* 4042! *King*, *Curtis* 683. Malacca; *Griffith* (K.D.) 2245/1! *Maingay* 773, 774! *Ridley* 3228. Pahang; *Ridley* 2667. Kedah; *Ridley* 5211. Perak; *Scortechini* 2123! *King's Collector* 1540, 1853, 8754. Distrib. Burma, China, Hongkong, Tonkin.

Var. *mollis*, Clarke in Hook. fil. Fl. Br. Ind. II, 524. Young branches very hispid throughout their whole length; leaves with numerous sub-adpressed and spreading stiff hairs on both surfaces, especially on the nerves. Vidal Syn. Pl. Filip. t. 51; fig. D. *M. molle*, Wall. Cat. 4046; Triana in Linn. Trans. XXVIII, 60; Cogn. in DC. Mon. Phan. VII, 346. *M. crinitum*, Naud. l.c. 524. *M. malabathricum* Blanco, Fl. Filip. Ed. III, tab. 152 (not of Linn.).

Singapore; *Wallich*. Distrib. Luzon; *Cuming* 853.

2. Melastoma imbricatum, Wall. Cat. 4047. A spreading shrub, 5 to 15 feet high; young branches (especially at the nodes and tips), petioles, pedicels and calyx covered with adpressed, lanceolate acuminate, serrulate scales. *Leaves* elliptic-oblong to ovate-oblong, rather abruptly narrowed at the base, the apex acute or acuminate; main nerves 5 (the two lateral slender); both surfaces strigose, the main nerves on the lower with adpressed scales; length 3·5 to 8·5 in., breadth 1·5 to 4·5 in., petiole ·35 to 1·35 in. *Cymes* solitary, terminal, condensed, 1·5 to 2 in. in diam., enclosed in bud by deciduous, lanceolate bracts and bracteoles. *Flowers* 7 to 15, 1·25 in. in diam.; the pedicels ·15 in. long. *Calyx-tube* urceolate, the teeth shorter than the tube, lanceolate-acuminate, deciduous. *Petals* oblong. *Anthers* short. *Fruit* ovoid-globose or sub-globose, truncate and shortly toothed at the mouth,

pulpy, ·8 in. in diam. when ripe. Triana in Trans. Linn. Soc. XXVIII, 60; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 524; Cogn. in DC. Mon. Phan. VII, 355. *M. obovatum* var. *oblongum*, Bl. ex Triana l.c. 60.

Perak; *Scortechini* 162! *King's Collector* 444, 6023, 8696, 10946! *Wray* 2980. Penang; *Wallich*, *Curtis*. Distrib. Sumatra, *Forbes* 2072! Brit. India (Khasia and Assam); Tonquin.

Easily recognised by its condensed cymes and rather small flowers.

3. Melastoma malabathricum, Linn. Sp. Pl. 559. A spreading shrub, 3 to 6 feet high; young branches, petioles and pedicels densely clothed with rather short, acute to acuminate, often serrulate scales. *Leaves* ovate-lanceolate, ovate-oblong or elliptic, the apex acute or shortly acuminate, petioles short, 3- to 5-nerved (the marginal pair when present slender); both surfaces strigose, the hairs sparser on the upper and pale; on the lower the hairs more numerous (especially on the minor nerves) and darker, the main nerves clothed with broad-based acuminate scales: length 2 to 5·5 in., breadth ·75 to 2·5 in.; petioles ·2 to ·5 in. long. *Corymbs* terminal, few-flowered, enveloped in bud by large, deciduous, ovate-cordate bracts; *flowers* 2 to 3 in. across, the pedicels ·2 to ·4 in. long. *Calyx*; the tube cylindric-campanulate, densely clothed externally with linear acuminate, entire or serrate, pale scales, almost glabrous within; the teeth shorter than the tube (rarely equal to it), acute or abruptly acuminate, the apex deciduous, scaly only near the midribs. *Flowers* 2 to 3 in. across. *Petals* purple. *Fruit* subglobular, truncate, pulpy, ·25 in. in diam. when dry. DC. Prodr. III, 145; Roxb. Hort. Beng. 33; Fl. Ind. II, 405; Wall. Cat. 4040; Bl. Bijdr. 1076; Bot. Reg. t. 672; W. and A. Prodr. 324; Wight Ill. t. 95; Dalz. and Gibs., Bomb. Fl. 92; Naud. in Ann. Sc. Nat. Ser. 3, XIII, 285; Thwaites Enum. 106 (α and β); Benth. Fl. Aust. III, 293; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 523; Kurz, For. Fl. I, 503, not of Miq. Fl. Ind. Bat. I, pt. I, 507; Naud. in Ann. Sc. Nat. Ser. 3, XIII, 273; Cogn. in DC. Mon. Phan. VII, 349. *M. affine*, D. Don in Mem. Wern. Soc. IV, 288; DC. Prodr. III, 145. *M. obvolutum*, Jack in Trans. Linn. Soc. XIV, 3; Cogn. in DC. Mon. Phan. VII, 348. *M. articulatum*, *M. heterostegium*, *M. novæ-hollandiæ* and *M. sechellarum*, Naud. in Ann. Sc. Nat. Ser. 3, XIII, 285, 286 and 290. *M. velutinum*, Seem. Fl. Vit. 90. *M. Banksii*, Cunn. ex Triana. *Trembleya rhinanthera*, Griff. Not. IV, 677.

In all the provinces. Distrib. British India and Malayan Archipelago, W. China, Seychelle Islands, N. Caledonia, N. Australia.

A widely distributed species varying in reality very little in localities widely separated. The differences have however been taken as the bases of many bad and doubtful species. In his *Flora Australiensis*, Mr. Bentham remarks (and apparently with justice) that the whole twenty-four species described by Naudin in Ann. Sc.

Nat. Ser. 3, XIII, pp. 283 to 293; should be reduced here. It is not without reluctance that I give four varieties as follows:—

VAR. 1. *polyantha*, Benth. Fl. Aust. III, 292. Bracts of inflorescence small and very early deciduous or altogether absent; teeth of calyx usually short; leaves not exceeding 2·5 in. in length. *M. polyanthum*, Blume in Flora for 1831, 480; Mus. Bot. I, 52, t. 6; Naudin in Ann. Sc. Nat. Ser. 3, XIII, 287; Miq. Fl. Ind. Bat. I, pt. I, 502; Triana in Linn. Trans. XXVII, 59; C. B. Clarke in Hook. fil. Fl. Br. Ind. III, 523. *M. brachyodon*, Naud. l.c. 292; Miq. Fl. Ind. Bat. I, 570, t. 8, fig. A. *M. malabathricum*, Desr. in Lam. Encyc. Bot. IV, 36; Ill. Gen. tab. 361, f. 1; Jack in Linn. Trans. XIV, 4, fig. 1, *a* to *g*; Poir. Dict. IV, 37; Bl. Bijdr. 1070. *M. erecta*, Jack l.c. 5; DC. Prodr. III, 145. *M. tidorense*, Bl. in Flora 1831, p. 482, Miq. l.c. 514. *M. Royenii*, Bl. l.c. 483. *M. tondanense*, Bl. Mus. Bot. I, 54. *M. Hombronianum*, *M. oliganthum* and *M. microphyllum*, Naud. l.c. 278, 292 and 293.

ANDAMANS; *King's Collector*. SINGAPORE; *Anderson*, *King*. MALACCA; *King*. PENANG; *Curtis*, *King*. DISTRIB. Burma, N. China, Sumatra, Java and other islands in the Malay Archipelago, Luzon, N. Australia.

VAR. 2. *adpressa*, C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 523. Leaves narrowly oblong-lanceolate, smaller than in the typical plant and with harsher pubescence. *M. adpressum*, Benth. in Wall. Cat. 4081, Naud. l.c. XIII, 27; Cogn. in DC. Mon. Phan. VII, 349. *M. anophanthum*, Naud. l.c. 277.

MALACCA; *Maingay* 771 to 773 in Herb., Kew. PENANG; *Wallich*, *King*, *Curtis*. PROVINCE WELLESLEY; *Curtis*.

This is scarcely worthy of separation as a variety. It is slightly smaller and more strigose than the type and differs from VAR. *polyanthum*, so far as I can see, only by the large size of the bracts of the inflorescence.

VAR. 3. *normalis*, King. Hairs of both surfaces very numerous, those of the upper sub-adpressed, of the lower sub-spreading, softer (almost silky); calyx-teeth long, adpressed hairy within. *M. normale*, Don Prodr. Fl. Nep. 220; DC. Prodr. III, 145; Naud. in Ann. Sc. Nat. Ser. 3, XIII, 289; Kurz, For. Flora I, 504; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 524; Triana in DC. Mon. Phan. VIII, 352. *M. Wallichii*, DC. l.c. 146. *M. napalense*, Lodd. Bot. Cab. t. 707. *M. pelagicum*, Naud. l.c. 279. *M. longifolium*, Naud. l.c. 293.

In most of the provinces.

VAR. 4. *perakensis*, King. Leaves more or less broadly elliptic, 5- to 7-nerved, the upper surfaces strigose (sometimes nearly glabrous in old specimens), the lower softly and rather densely pubescent; branches, petioles and pedicels with long, spreading, rather soft hairs; calyx-tube densely clothed with long, flexuose, soft, often ciliate setae,

the lobes large, adpressed strigose on both surfaces: flowers occasionally only 1·25 in. in diam.

PERAK; *Ridley* 2935! *Curtis* 1298! *Wray* 1733, 1883! *King's Collector* 2173, 2091, 8463! *Scortechini* 780. SINGAPORE; *Hullet* 5728. SELANGORE; *Ridley* 1996. DISTRIB. Java; *Forbes* 1142*a*.

This has broader leaves more softly hairy than VAR. *normalis*. The bristles of the calyx are much longer than in any other form of *M. malabathricum* and approach in number, length and density those of *M. sanguineum*, Don. A form of this from Perak, with the calyx-hairs shorter than the type, connects it with *M. imbricatum*, Wall.

3. Oxyspora, DC.

Large spreading shrubs with drooping branches terminated by large, lax, almost naked panicles of rose-purple flowers. *Leaves* opposite, long-petioled, large, 5- to 7-nerved, ovate, acuminate. *Panicle* long, lax, sometimes narrow, the branches decussate, the flowers on the branchlets not glomerulate, bracts very small. *Calyx-tube* ovate, cylindric or funnel-shaped, its teeth 4, short, triangular. *Stamens* 8, four large with elongated anthers and four small, or all equal, opening by a single apical pore; the base produced and bilobed, the connective with or without an appendage. *Ovary* inferior, 4-celled, its apex glabrous; style simple, elongate; ovules numerous; the placentas axile, radiating. *Capsule* dry, elongate, double fusiform, with 8 ribs. *Seeds* numerous, falcate; the raphe lateral, produced at the apex into a point in front. DISTRIB. Seven species, Indian and Malayan.

Anthers dissimilar; petioles not winged	1. *O. stellulata.*
Anthers similar:—	
Petioles not winged	2. *O. acutangula.*
,, winged	3. *O. Curtisii.*

NOTE.

The genera *Allomorphia* and *Oxyspora* were so difficult of separation even before the discovery of the new species herein described (*viz.*, *A. alata*, Scort., *O. acutangula* and *O. Curtisii*) that Baillon (*Hist. des Plantes* VII, 48) united them. In Baillon's time *Oxyspora* was distinguished mainly by having four of its eight stamens much larger than and differently coloured from the other four. The three older species (all British Indian) *O. paniculata*, *O. vagans*, and *O. cernua* and the new Malayan one *O. stellulata* have this character, which would form an excellent head-mark for the genus if it did not break down. The character, however, does break down, for in the two Malayan plants here published as *O. acutangula* and *O. Curtisii* the eight anthers are all equal, although in all other respects these plants have the facies of the older species of *Oxyspora*. I have referred these to *Oxyspora* as preferable to the alternative course of putting them into *Allomorphia*, and I have therefore, in order to admit them, modified the generic character of *Oxyspora* as regards anthers. *Oxyspora*, as here defined, thus depends for its separation as a genus on its open paniculate inflorescence and long double fusiform boldly-ridged capsules, while *Allomorphia* is characterised by shortly-branched panicles, on the ultimate branchlets

of which the flowers are clustered in pseudo-glomeruli, while the capsules are not much longer than broad and are often urn-shaped.

1. Oxyspora stellulata, King, n. sp. A shrub, 15 to 20 feet high; young branches, petioles, inflorescence and calyx-tube covered with pale, minute, stellate-hairy scales. *Leaves* somewhat unequal, ovate, slightly cordate at the rounded base, the apex shortly apiculate, 7-nerved (the middle nerve very strong); both surfaces free from hairs, but (especially the upper) with numerous minute hairy scales most numerous on the nerves, the transverse veins on the lower very distinct and straight; length 5 to 9 in.; breadth 2·25 to 4·5 in.; petiole 1·25 to 4 in. *Panicle* solitary, terminal, longer than the leaves; the branches in pairs, divaricate; flowers in umbels of 4 to 6 on the ultimate branchlets. *Calyx-tube* funnel-shaped, sub-tetragonous, the mouth with four small triangular teeth, narrowed at the base into the short pedicel. *Petals* 4, orbicular-ovate, blunt, glabrous. *Stamens* 8, very unequal, four linear, purple and twice as long as the other 4 short, yellow. *Disc* of 4 incurved plates. *Ovary* 4-winged. *Capsule* clavate, opening by 4 broad truncate valves; seeds minute, shortly beaked.

Perak; *Scortechini* 249 *in part! King's Collector* 418, 2851! *Wray* 1224. Distrib. Sumatra, *Forbes* 3034.

2. Oxyspora acutangula, King, n. sp. A bush; young branches boldly 4-angled, glabrous. *Leaves* elliptic-oblong, somewhat narrowed to the rounded base, the apex acute, 5-nerved; upper surface glabrous, the lower minutely lepidote-pubescent on the nerves and veins; length 4 to 6 in., breadth 1·75 to 2·5 in., petiole ·6 to ·75 in., minutely lepidote. *Panicle* solitary, terminal, usually somewhat shorter than the leaves, broadly pyramidal, lepidote-puberulous, many-flowered. *Flowers* (including the stamens) ·5 in. long. *Calyx-tube* funnel-shaped, minutely rufous-stellate lepidote, the mouth with 4 small triangular teeth. *Petals* 4, glabrous, broadly ovate, blunt. *Stamens* 7 or 8, equal, lanceolate, acuminate, slightly curved, the lobes at the base short, rounded, appendages none, but a grooved, narrow process on the back of the connective in the lower half. *Capsule* ovoid, narrowed to the equally long pedicel, 8-ridged, glabrous, the mouth with an everted rim, ·25 in. long.

Perak; *Wray* 329.

3. Oxyspora Curtisii, King. A shrub; branchlets bluntly 4-angled not winged, puberulous. *Leaves* ovate-acuminate, the base rounded, not passing into the petiole, 7-nerved, upper surface sparsely strigose, minutely lepidote, the lower glabrous, the edges glandular-serrulate; length 5 to 7 in., breadth 3 to 4 in., petioles 1·5 to 2·5, broadly winged, the wing much expanded at the base and joining that of the opposite leaf. *Panicle* solitary, terminal, spreading, longer than the leaves, with

numerous 4-angled branches, bracteate, everywhere minutely lepidote; the larger branches bearing a pair of very unequal bracts near the base exactly like the stem-leaves but smaller. *Flowers* on slender pedicels as long as the calyx-tube. *Calyx-tube* cylindric, 8-ribbed, tapering to base and apex; the mouth expanded and truncate but with 4 minute teeth. *Petals* 4, as long as the scaberulous filaments. *Stamens* 8, much exserted; the anthers longer than the filaments and longer than the calyx-tube, linear, acuminate, very slightly lobed at the base and inappendiculate. *Capsules* fusiform, ·2 in. long, much expanded at the mouth.

PERAK; *Curtis* 1300.

The only specimen of this which I have seen is in Mr. Curtis's Herbarium.

The species resembles *Allomorphia alata*, Scort. in its eight equal stamens, in the shape of its leaves and in its winged petioles; but differs in its more elongated capsules (which are fusiform instead of globose), in its larger laxer panicles and in its conspicuously bristle-serrate leaves. The two species just described form very marked connecting links between the genera *Allomorphia* and *Oxyspora*.

4. ALLOMORPHIA, Blume.

Shrubs, tall or short. *Leaves* opposite, long-petioled, large, lanceolate, ovate or orbicular, nerved, glabrous or nearly so. *Panicles* terminal, compound, with small flowers in clustered whorls. *Calyx-tube* funnel-shaped or campanulate, limb of 3 or 4 very short lobes. *Petals* 3 or 4, rose or white, small. *Stamens* 6 or 8, nearly equal; anthers attenuated at the top with one pore, cells long-produced and diverging at their bases; connective without appendage. *Ovary* 3- (rarely 4-) celled, enclosed by but nearly free from the calyx-tube; style filiform, simple; ovules very many, placentas axile, 2-fid. *Capsule* small, dry, not much longer than broad, usually urn-shaped, ribbed, opening at the top by 3–4 valves. *Seeds* very many, narrowly obtrapezoidal. DISTRIB. Species 5: whereof 4 are from the Malay Peninsula and its attached islands; 1 from Canton.

Petioles not winged:—		
Calyx-tube with 3 or 4 teeth; stamens unequal; anthers sagittate at base; capsule ribbed	1.	*A. exigua.*
Calyx-tube without teeth; stamens equal; anthers only slightly lobed at the base; capsules not ribbed	2.	*A. Wrayi.*
Petioles winged:—		
Branches of the panicle winged; capsule sub-globular ...	3.	*A. alata.*

1. ALLOMORPHIA EXIGUA, Blume in Flora 1831, II, 523. A shrub, 2 to 10 feet high; branches slender, subangular, puberulous or glabrous. *Leaves* elliptic-ovate to ovate-lanceolate, acuminate, those of the same pair often unequal in size; the base rounded or narrowed, not cordate;

upper surface very sparsely strigose (glabrous in old leaves); the lower glabrous, pale, the transverse nerves prominent; length 4·5 to 11 in.; breadth 1·5 to 5 in.; petiole ·75 to 4 in. *Panicle* usually solitary, terminal, often longer than the leaves, lax, minutely rusty-pubescent; bracts lanceolate or oblong, deciduous; the *flowers* ·1 in. long, shortly pedicellate, in stalked umbels on the ultimate branchlets or in subsessile fascicles. *Calyx* rusty-puberulous, with 3 or 4 short broad teeth. *Stamens* 6 or 8, alternately long and short, sagittate at the base and with a small linear appendage behind. *Petals* 3 or 4, rosy. *Capsule* less than ·1 in. long, boldly 6-ribbed. Naud. in Ann. Sc. Nat. Ser. 3, XV, 310; Triana in Trans. Linn. Soc. XXVIII, 74; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 527; Cogn. in DC. Mon. Phan. VII, 464. *Melastoma exigua*, Jack in Trans. Linn. Soc. XIV, 10, tab. 1, fig. 2; DC. Prod. III, 149. *M. impuber*, Roxb. Fl. Ind. II, 405; Wall. Cat. 4048.

Malacca; *Griffith* 2263 & 4 (K.D.); *Maingay* 776 (K.D.); *Harvey*. Penang; *Wallich* 4048; *Curtis* 399; *Griffith*; *King*. Perak; *Scortechini* 227, 383; *Wray* 160; *King's Collector* 450, 2302, 3106. Distrib. Sumatra; *Forbes* 3062.

There is some variety in this plant as regards size and inflorescence. A slender form, which never exceeds 2 or 3 feet in height and which has smaller leaves than the type, seems worthy of separation as a variety. It appears to have been so recognised by Wallich who, in distributing his Herbarium, distinguished it by the letter *a*. A less distinctly marked form is one in which the flowers are grouped on the branches of the inflorescence in dense almost sessile fascicles.

Var. *minor*, King. Leaves narrowly elliptic, tapering much to base and apex, 2 to 4·5 in. long; inflorescence slender, few-flowered, very lax: height only 2 to 3 feet.

Penang; *Wallich*, Cat. 4048*a*; *Curtis* 73. Perak; *Scortechini* 1702; *Wray* 161, 3414; *King's Collector* 2302.

2. Allomorphia Wrayi, King, n. sp. A shrub, 2 to 4 feet high; branches and petioles with flexuose, spreading, ferruginous hairs. *Leaves* 7-nerved, broadly ovate to rotund-ovate, the apex shortly and abruptly acuminate, the base narrowed, the edges obscurely and minutely bristle-toothed: upper surface very sparsely strigose or glabrous, often with minute, brown scales on the chief nerves; lower glabrous; length 5 to 9 in., breadth 3·5 to 5·5 in.; petiole 2·25 to 2·75 in. *Panicles* solitary, axillary, slightly longer than the petioles but much shorter than the leaves, glabrous or rusty puberulous towards the extremities: the branches short, spreading, rather condensed when young, few flowered. *Calyx-tube* widely campanulate, minutely rusty-puberulous or almost glabrous, without ribs; the mouth truncate, slighly waved but not toothed. *Petals* 4. *Stamens* 8, equal, the anthers lobed but not sagittate at the base, the back with a slight supra-basal appendage

Capsule glabrous, sub-globular, slightly contracted below the sub-membranous truncate mouth, under ·1 in. in diam.

Perak; *Wray* 2483; *King's Collector* 2061, 2380, 2773; *Scortechini* 50, 425. Penang; *Curtis* 2008.

A species allied to *A. exigua*, Bl. but with pubescent branches and petioles, shorter and more contracted panicles, a wider, toothless calyx-tube, sub-globular capsules and equal anthers only slightly lobed at the base. In Mr. Wray's field-note on his specimens he remarks that the flowers are white and the leaves dark shining green above and crimson beneath.

3. Allomorphia alata, Scortechini Mss. A glabrous shrub, 3 to 6 feet high; the branchlets broadly winged. *Leaves* ovate or elliptic-ovate, the apex shortly acuminate; the base narrowed into the broadly-winged petiole, 5-nerved; both surfaces glabrous, the edges shortly bristle-toothed; length 5 to 10 in., breadth 2·5 to 4·5 in., petiole ·75 to 4 in. *Panicle* solitary, terminal, often nearly as long as the leaves, lax; its branches diverging, 4-angled and 4-winged, very minutely rusty lepidote-puberulous. *Flowers* clustered in small umbels near the ends of the branches, the bases of the umbels sometimes with a ring of bracteoles and minute imperfect flowers. *Calyx-tube* cylindric-ovoid, the limb expanded and with 4 small, persistent teeth. *Petals* 4, twice as long as the calyx-teeth but shorter than the filaments. *Stamens* 8, equal, exserted, much longer than the calyx-tube. *Anthers* linear-acuminate, longer than the scaberulous filaments, very slightly lobed at the base and almost inappendiculate. *Capsules* sub-globular, 8-ribbed, glabrous, the mouth truncate, diam. ·1 in.

Perak; *Scortechini* 236; *Wray* 1327; *Curtis*; *King's Collector* 572, 2047.

The leaves of the same pair differ, often considerably, in size.

5. Blastus, Lour.

Shrubs. *Leaves* membranous, petiolate, ovate- or oblong-lanceolate, acuminate, entire or sinuate-serrate, 3- to 5-nerved. *Flowers* small 4-merous, ebracteolate. *Calyx-tube* oblong-campanulate or shortly oblong; the limb not expanded, truncate, minutely 4-lobed. *Petals* 4, ovate, obtuse, glabrous, convolute into a cone before expansion. *Stamens* 4, equal, the filaments thin: anther incurved subulate, opening by a single apical pore; basal lobes divaricate, the connective inappendiculate. *Ovary* adhering to the calyx, 4-celled; style filiform; stigma punctiform. *Capsule* obovoid or sub-globular, slightly 4-grooved; dehisching slowly by 4 valves. Seeds minute, numerous, irregularly recurved, reniform. Distrib. 3 species in Malaya, China, Cochin China and India.

Blastus Cogniauxii, Stapf in Hook. Ic. Pl. t. 2311. A shrub, 6 to 10 feet high; young branches slender, as thick as a crow-quill, scaly, glabrous or puberulous. *Leaves* equal, oblong-lanceolate, narrowed at the base, the apex acuminate, 5-nerved (the marginal pair faint), the edges sub-entire; upper surface glabrous, with a few scattered, small glands; lower glandular-punctate, minutely furfuraceous on the nerves; length 4 to 7 in.; breadth 1 to 2·25 in., petiole ·3 to ·75 in. *Panicles* axillary or terminal, slender, much shorter than the leaves, glandular-scaly, the few divaricate branchlets bearing the flowers in dense terminal glomeruli of 6 to 9. *Calyx* shortly tubular, scaly, the teeth minute. *Anthers* narrowly ovate with many small yellow glands near the base. *Capsule* subglobular, truncate, ·1 in. in diam., subglabrous; seeds linear. *Ochthocaris parviflora*, Cogn. in DC. Mon. Phan. VII, 421.

Perak; common. Distrib. Borneo.

This is closely allied to *B. cochinchinensis*, Lour., but differs notably in its paniculate inflorescence.

6. Ochthocharis, Blume.

Small, erect, glabrous shrubs, branches round or obtusely 4-angled. *Leaves* opposite, petioled, oblong or lanceolate, 3–7-nerved, minutely denticulate-serrulate. *Flowers* minute, in axillary clustered cymes, rarely in axillary lax cymes or in lax terminal cymose panicles. *Calyx-tube* obovoid, smooth; teeth 5, small, persistent. *Petals* 5. *Stamens* 8 or 10, equal; anthers oblong, obtuse at the top, opening with one pore, at the base shortly produced or not; connective with or without an appendage. *Ovary* inferior, 4- or 5-celled, glabrous at the apex; style simple, filiform; ovules very many, placentas axile. *Capsule* globose, 5-valved, enclosed by the membranous calyx-tube. *Seeds* very many, irregularly club-shaped. Distrib. Species 5 or 6, extending from Singapore to Borneo.

Connective of anthers with no appendage at the base behind:—		
Flowers in a terminal panicle, 5-merous	1.	*O. paniculata.*
„ fascicles, 4-merous	2.	*O. borneensis.*
Connective of anthers with an appendage at the base behind:—		
Erect; flowers 5-merous; leaves 3-nerved	3.	*O. javanica.*
Decumbent; flowers 4-merous; 5- to 7-nerved... ...	4.	*O. decumbens.*

1. Ochthocharis paniculata, Korth. in Verh. Nat. Gesch. Bot. 247 t. 64. A small shrub with slender quadrangular branches, rusty pubescent towards the tips. *Leaves* membraneous, elliptic-lanceolate, tapering to each end, the edges minutely bristle-serrate, 5- to 7-nerved (the marginal pair faint); upper surface glabrous; the lower somewhat pale,

scaly-puberulous on the nerves and prominent transverse veins; length 2·5 to 5 in., breadth 1·25 to 2 in., petiole ·35 to 8·5 in. *Panicle* cymose, terminal, spreading, less than half as long as the leaves; branches opposite, pedicels unequal, bracteolate at the base, not quite so long as the flowers. *Petals* 5, ovate-acuminate. *Stamens* 10, anthers oblong, blunt, not produced at the base and with the connective inappendiculate. *Capsule* depressed-globular, glabrous, with 5 shallow grooves, ·2 in. in diam. Blume Mus. Bot. I, 40; Naud. in Ann. Sc. Nat. ser. 3, XV, 307, with fig.; Miq. Fl. Ind. Bat. I, pt. I, 556; Triana in Trans. Linn. Soc. XXVIII, 74. C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 528; Cogn. in DC. Mon. Phan. VII, 480. *Melastoma oxyphyllum*, Benth. in Wall. Cat. 4083.

Singapore; *Wallich*. Distrib. Borneo.

2. Ochthocharis borneensis, Blume Mus. Bot. Lugd. Bat. I, 40. A shrub, 3 or 4 feet high. *Leaves* membranous, elliptic-lanceolate, 5-nerved (the lateral pair small), acuminate, the base cuneate, the edges minutely dentate, upper surface glabrous, the lower pale, minutely and furfuraceously stellate-hairy on the main and rather prominent tranverse nerves; length 3 to 4·25 in.; breadth 1·25 to 1·75 in.; petioles sparsely stellate-hairy, unequal, ·3 to 1·8 in. long. *Flowers* in fascicles of 4 to 7, from tubercles on the stem below the leaves; the buds conical, ·1 in. long; pedicels slender, ebracteolate, ·25 to ·3 in. long. *Petals* 4, broadly ovate, narrowly acuminate. *Stamens* 8; the anthers oblong, blunt, neither produced nor appendiculate at the base. *Capsule* depressed-globular, glabrous, faintly 5-grooved, ·2 in. in diam. Naud. in Ann. Sc. Nat. Ser. 3, XV, 307; Cogn. in DC. Mon. Phan. VII, 480. *O. buruensis*, Teysm. and Binn. in Nat. Tijdschr. Ned. Ind. XXV, 426; Miq. in Ann. Bot. Lugd. Bat. I, 216.

Singapore; *Ridley* 6221. Distrib. Borneo, Molluccas.

3. Ochthocharis javanica, Blume in Flora 1831, 523. A shrub, 2 or 3 feet high. *Leaves* subcoriaceous, lanceolate or oblong-lanceolate, acute, the base cuneate, 3-nerved; both surfaces glabrous and with the nerves indistinct; the lower rather pale when dry, the edges remotely bristle-serrate; length 2 to 3·5 in.; breadth ·6 to 1 in.; petiole ·2 to ·5 in. *Cymes* or fascicles about as long as the petioles, few-flowered; pedicels slender, minutely bracteolate at the base, ·15 to ·45 in. long. *Flower*-buds ·15 in. long, much pointed. *Petals* 5, broadly ovate, abruptly acuminate. *Anthers* 5, twice as long as the filaments, minutely spurred at the base behind. *Capsule* subglobular, with 5 shallow grooves, glabrous, ·15 to ·2 in. in diam.; the placentas persistent, woody, rough on their outer surfaces. Naud. in Ann. Sc. Nat. Ser. 3, XV, 307; Miq. Fl. Ind. Bat. I, pt. I, 556; Kurz, For. Fl. I, 507. Triana Melast. 74, tab. VI, fig. 67; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 528;

Cogn. in DC. Mon. Phan. VII, 480. *Melastoma? littoreum*, Wall. Cat. 4087.

A sea-shore plant, SINGAPORE, JOHORE, MALACCA, PERAK. DISTRIB. Burma, Borneo, Java.

4. OCHTHOCHARIS DECUMBENS, King, n. sp. A creeping or decumbent shrub, 3 to 5 feet long; stems as thick as a swan's quill, rounded, often rooting at the nodes. *Leaves* thinly coriaceous, elliptic-lanceolate, shortly acuminate, rounded or cuneate at the base, the edges obscurely bristle-serrate, 5–7-nerved; upper surface glabrous; the lower pale and with a few minute, scattered scales; length 5 to 7·5 in.; breadth 2 to 3 in.; petioles unequal, stout, sparsely scaly, ·5 to 1·25 in. long. *Flowers* in dense, axillary cymes shorter than the petioles, the pedicels short, bracteolate. *Calyx-tube* glabrous, faintly ribbed, the teeth 4, small. *Petals* 4, broadly ovate, acuminate. *Stamens* 8; the anthers curved, tapering to the truncate apex, slightly produced at the base and with a minute tubercle behind. *Capsule* depressed-globose, glabrous, faintly 4-grooved, ·18 in. in diam.

PERAK; *King's Collector*, 2833, 10425.

7. ANERINCLEISTUS, Korth.

Shrubs; branches often round. *Leaves* petioled, ovate or lanceolate, entire, 3–7-nerved. *Flowers* small. *Calyx-tube* campanulate or funnel-shaped; lobes 4, usually very small. *Petals* 4, minute, glabrous. *Stamens* 8, equal; anthers attenuate at the top, opening by one pore, scarcely produced at the base; connective with or without a short spur. *Ovary* nearly free, 4-celled; style filiform, simple; ovules many. *Capsule* splitting by 4 large valves at the summit. *Seeds* exceedingly minute, cuneate-obovoid. DISTRIB. Species 9 or 10; Malaya and Burma.

Inflorescence umbellate; leaves small, oblong- or elliptic-lanceolate:—
- Nearly glabrous in all its parts ... ... 1. *A. macranthus.*
- More or less pilose:—
  - Calyx-tube mealy tomentose, the teeth narrow, glandular ciliate on the edges ... ... 2. *A. Scortechinii.*
  - Calyx-tube not tomentose but with many long spreading gland-tipped hairs, the teeth minute and without hairs 3. *A. Curtisii.*

Inflorescence a large panicle; leaves large, ovate:—
- Panicle densely tomentose, leaves 7-nerved ... ... 4. *A. floribundus.*
- Panicle clothed with short, flat, adpressed, scale-like hairs, leaves 5-nerved ... ... 5. *A. sublepidotus.*

1. ANERINCLEISTUS MACRANTHUS, King, n. sp. A small shrub; young branches with pale lenticels, glabrous except for a few adpressed hairs at the apices. *Leaves* nearly equal, elliptic-lanceolate, much narrowed to the base, the apex shortly acuminate; both surfaces

glabrous, the lower pale when dry; length 2·5 to 4 in., breadth ·8 to 1·5 in., petiole ·4 to ·8 in., strigose. *Umbels* axillary or terminal, usually solitary, 4- 5-flowered, on slender, sparsely strigose peduncles shorter than the leaves. *Flowers* (including the stamens) ·5 in. long. *Calyx-tube* infundibuliform, sparsely adpressed-pilose, nearly as long as the slender strigose pedicel; the mouth with 4 narrowly triangular acuminate, erect, persistent teeth nearly as long as the tube. *Petals* 4, ovate, acuminate, glabrous, slightly longer than the calyx-teeth. *Stamens* 8, slightly unequal, the alternate 4 shorter but of the same shape as the longer 4, the base in all emarginate, scarcely lobed but with a very short process behind. Scales of disc 4, their apices broadly truncate and slightly toothed. *Capsule* globose-ovoid, ·25 to ·3 in. long.

Perak; at elevations of 2000 to 4000 feet, *Scortechini*; *Wray* 297, 1621.

A species near to *A. hirsutus*, Korth., but differing in being glabrous and in having larger flowers which, according to Mr. Wray, are pink. The umbels of this, when in bud, are enclosed in oblong, deciduous, sparsely strigose bracts.

2. Anerincleistus Scortechinii, King, n. sp. A slender shrub, 3 to 4 feet high; young branches, petioles and inflorescence with many spreading and sub-adpressed, gland-tipped hairs. *Leaves* very unequal (one of each pair very small), oblong, slightly narrowed to the rounded base, the apex acuminate, the edges ciliate; main nerves 3 to 5, the minor nerves transverse, rather faint; both surfaces usually glabrous, the upper sometimes sparsely strigose, the main nerves on both and the transverse on the lower surfaces bristle-hairy; length of the larger leaf of the pair 2·5 to 4 in., breadth ·8 to 1·4 in.; petiole ·3 to ·4 in; the smaller leaf of the pair from one-fourth to one-half as large and sub-sessile. *Inflorescence* axillary, solitary on a slender peduncle about as long as the smaller leaf, umbellately cymose, 6- to 10-flowered. *Calyx-tube* globose-campanulate, minutely mealy tomentose, about as long as the pedicel; teeth 4, narrow, reflexed, each ending in a bristle and the margins bearing 6 or 8 long straight hairs with small glandular apices. *Petals* 4, ovate, glabrous, shorter than the calyx-teeth, each with a slender, gland-tipped, reflexed hair at the apex. *Anthers* 8, equal, acute, very slightly lobed at the base and inappendiculate; *style* thick, straight; stigma small. *Ovary* crowned by obtuse, sometimes crenulate scales.

Perak; *Scortechini* 51, 450; *Curtis*.

This closely resembles *A. Curtisii*, Stapf, but is distinguished at once by the calyx which has its tube covered with minute mealy pubescence while the teeth are long, reflexed, with long glandular hairs on the edges, whereas in *A. Curtisii* the calyx-tube bears many long glandular hairs and the teeth are triangular, minute

and hairless. The leaves of *A. Curtisii* moreover are strigose between the nerves on both surfaces.

3. Anerincleistus Curtisii, Stapf in Kew. Bull. for 1892, p. 196. A small shrub, like *A. Scortechinii*, the young branches, petioles, and inflorescence spreading slightly and not gland-tipped; *leaves* as in *A. Scortechinii* but strigose on both surfaces. *Calyx-tube* with numerous subulate, gland-tipped, spreading hairs; the teeth minute, triangular and without hairs. *Anthers* blunt.

Penang; *Curtis* 412.

4. Anerincleistus floribundus, King, n. sp. A shrub, about 15 feet high: young branches, petioles and panicles densely and shortly tawny-tomentose. *Leaves* unequal, ovate, shortly acuminate, 7-nerved at the rounded base, (the main nerve giving off a pair about 1 in. from the base); upper surface with a few short scattered bristles, the main nerves densely bristly-pubescent; lower surface with short coarse hairs especially on the nerves and veins; length 5 to 9 in.; breadth 4 to 5·5 in.; petiole 1 to 2 in., one leaf of each pair smaller than the other. *Panicle* terminal, solitary, longer than the leaves, much branched, the branches unequal and in pseudo-whorls, many-flowered, the ultimate branchlets few-flowered, cymose. *Calyx-tube* funnel-shaped, tapering into and longer than the pedicel, adpressed-pilose: the mouth truncate and with 4 small broadly triangular teeth and 4 alternating tufts of inwardly-directed hairs. *Petals* 4, shorter than the calyx-tube, broadly triangular or occasionally quadrate, apiculate, glabrous. *Stamens* 8, equal, or 2 smaller and sometimes suppressed; *anthers* curved, with two deep broad lobes at the base but no appendage. *Capsule* broadly obovoid, truncate, tapering at the base; seeds minute, broadly linear.

Perak; *Scortechini* 249 in part; *Ridley* 5342; *Curtis* 1299.

5. Anerincleistus sublepidotus, King, n. sp. A shrub, 10 to 15 feet high; young branches, petioles and inflorescence densely clothed with short, flat, adpressed, scale-like pale hairs. *Leaves* somewhat unequal, ovate, shortly acuminate, on long petioles, 5-nerved, entire; upper surface glabrous except for a few minute scale-like hairs, the main nerves hairy like the petiole; lower surface much reticulate, minutely lepidote-hairy, the middle nerve hairy like the petiole; length 4 to 8 in., breadth 2 to 4 in.; petiole 1 to 1·5 in. *Panicle* terminal, solitary, erect in flower, pendent in fruit, usually longer than the leaves, few-branched; the ultimate branches unequal, short, few-flowered, some of them in pseudo-whorls, pedicels less than ·1 in. long. *Calyx-tube* ·15 in. long, (when dry) reddish, clothed with scattered, adpressed scale-like hairs, tubular-campanulate; the teeth 4, short, acute. *Petals* 4, ovate, acuminate, glabrous, shorter than the calyx-tube. *Stamens* 8,

subequal, all yellow, curved, deeply lobed at the base but inappendiculate. *Capsule* obovoid, much tapered to the pedicel, ·15 in. long (when dry), scabrid from the stiff, strigose, scale-like hairs. *Seed* minute subulate.

PERAK; *Scortechini* 310; *King's Collector* 8068.

NOTE.

I take the opportunity to describe here the undernoted new species from Borneo.

ANERINCLEISTUS GLOMERATUS, King, n. sp. A shrub; young branches, petioles, main nerves of leaves and inflorescence densely covered with short, coarse, adpressed, pale hairs. *Leaves* narrowly oblong, narrowed towards the base, the apex acuminate; upper surface glabrous but with a few scattered glands; lower surface with a few pale hairs of unequal length on the bold transverse veins; length 3·5 to 8 in.; breadth 1 to 2 in.; petiole ·5 to 1·5 in. *Panicle* solitary, terminal, very narrow, bearing a few very short, almost sessile, 4- to 6-flowered umbels. *Flowers* on pedicels about half the length of the calyx-tube. *Calyx-tube* short, campanulate, pubescent; the mouth wide and with 4 short, triangular, acute, spreading teeth alternating with tufts of hair. *Petals* 4, narrowly oblong, spreading. *Stamens* 8, equal; *anthers* slightly lobed at the base, inappendiculate. *Ovary* 4-ridged, 4-celled; ovules numerous. *Capsule* sub-globular.

BORNEO; Sarawak, *Hullett* 257.

A species resembling *A. anisophyllus*, Stapf, in the shape of its leaves. The inflorescence is however very different; and in its short subsessile panicle recalls to one's memory *A. Beccarianus*, from which its leaves distinguish it at once.

8. SONERILA, Roxb.

Low herbs, rarely half-shrubs. *Leaves* membranous or more or less fleshy, opposite, those of a pair similar in shape, although often very different in size, or distinctly heteromorphous and then often apparently alternate, usually more or less oblique, 3–7-nerved from the base or near the base, rarely pinnate-nerved. *Flowers* pink or white, in scorpioid simple or pseudo-umbellate cymes, 3-nerved. *Calyx* subcylindrical, turbinate or campanulate, 3-lobed or 3-toothed. *Petals* ovate, obovate or oblong, acute, acuminate or obtuse. *Stamens* 3, equal, rarely 6 and slightly unequal; *anthers* linear, oblong or lanceolate, obtuse, acute or (often long) acuminate, minutely 2-lobed at the base, without appendages, dehiscing with apical pores. *Ovary* attached to the calyx-tube by narrow longitudinal septa, depressed at the apex, 3-celled; *style* filiform; stigma punctate or capitellate. *Fruit* enclosed in the persistent, ultimately spongy calyx-tube and forming with it a usually more or less trigonous, subcylindrical, turbinate or hemispherical false capsule, dehiscing from the centre of the depressed top with 3 valves or 6 fine teeth. *Seeds* minute, numerous, ovoid, pyramidal or clavate,

smooth or asperulous; raphe usually thick, spongy. Species over 100 throughout tropical Asia.

Leaves similar, although often very unequal in size. Stamens 3. Fruit usually smooth (see No. 12–14); valves entire, distinct, exceeding the margin of the mature calyx (§ Eu-Sonerila):—

Erect or ascending herbs with fibrous roots and without rhizome:—

Calyx very slender (also in fruit); stem with 2 somewhat raised, commissural lines. Very scantily hairy or glabrous, often much branched and small- or narrow-leaved (except No. 1) herbs:—

Leaves ovate, 1–1·7 in. by ·7–·9 in. ... ... 1. *S. epilobioides.*

Leaves much smaller or at least very much narrower:—

Anthers ·12–·18 in. long:—

Leaves oblong to elliptic-oblong, ·3–·5 by ·15–·23 in. ... ... 2. *S. calaminthifolia.*

Leaves lanceolate, 1–1·75 in. by ·15–·23 in. ... 3. *S. hyssopifolia.*

Anthers ·06–·09 in. long ... ... 4. *S. erecta.*

Calyx more or less oblong- or ovoid-campanulate; fruit turbinate or obpyramidal. Stem terete or quadrangular:—

Leaves more or less ovate, long acuminate, 1–2 in. by ·4–1 in. or still smaller, acutely and coarsely toothed, thin, 3–5-nerved from the very base; petioles long, very slender ... ... 5. *S. tenuifolia.*

Leaves usually larger, not coarsely toothed:—

Upper side-nerves starting from above the base:—

Leaves pinnatinerved, acute or acuminate at the base ... ... 6. *S. flaccida.*

Leaves not pinnatinerved (rarely subpinnatinerved in No. 7); all the side-nerves springing from near the base, rarely the uppermost from near the middle:—

Cymes distinctly peduncled:—

Anthers subacute, ·09–·12 in. long; leaves membranous, rounded or subcordate at the base ... ... 7. *S. andamanensis.*

Anthers slender, acuminate, ·2–·3 in. long:—

Stem, petioles and inflorescence minutely tomentose; leaves thinly membranous, subcordate at the base on very long and slender petioles ... ... 8. *S. populifolia.*

Stem, petioles and inflorescence with long hairs; leaves acute or rounded, but not subcordate at the base:—

Leaves membranous, more or less oblong, usually acute at the base ... 9. *S. pallida.*

Leaves somewhat fleshy, rounded at the base :—
Hairs more or less spreading, often very long, particularly on the petioles and near the leaf margins; leaves light-brown beneath ... 10. *S. rudis.*
Hairs adpressed, very soft; leaves glaucous beneath with rufous hairs 11. *S. mollis.*

Cymes sessile, reduced to few-flowered fascicles :—
Unbranched or almost unbranched herbs :—
Leaves fleshy, very dark and glabrous above, glaucous or pale-brown with rufous nerves beneath; calyx with scattered gland-tipped hairs ... ... 12. *S. albiflora.*
Leaves membranous, more or less covered on both sides with rufous flexuous hairs; calyx densely hirsute ... ... 13. *S. lasiantha.*
Suffrutescent, much branched ... ... 14. *S. suffruticosa.*

All the nerves springing from the very base of the leaf; adult leaves quite glabrous, broadly elliptic, fleshy ... ... 15. *S. elliptica.*

Herbs with short stems, springing from a creeping rhizome and with usually crowded to rosulate leaves and terminal or subterminal peduncled cymes :—
Leaves 3–7 in. by 2–4 in., 7-nerved from the very base with conspicuous subhorizontal transverse veins :—
Stem, petioles and peduncles very succulent, stout 16. *S. succulenta.*
Stem, petioles and peduncles usually slender ... 17. *S. repens.*

Leaves small; uppermost side-nerves springing from above the base; transverse veins indistinct or 0 :—
Leaves oblong to lanceolate-oblong, 2–3·7 in. by ·3–1·4 in., pinnatinerved ... ... 18. *S. muscicola.*
Leaves much smaller, not or very indistinctly pinnatinerved, lateral nerves springing from below the middle :—
Leaves oblong-lanceolate to lanceolate, acute at both ends ... ... 19. *S. saxosa.*
Leaves ovate to elliptic or oblong, rounded or subcordate at the base :—
Stem 1–3 in. long; leaves broad, crowded, in about 3 pairs; petioles ·3–·7 in. long :—
Leaves entire, not ciliate; ·9–1·7 in. by ·6–1·2 in.; petals ·35 in. long; anthers ·15–·2 in. long 20. *S. congesta.*
Leaves toothed, ciliate, ·4–·8 in. by ·4–·6 in.; petals ·25 in. long; anthers ·12–·15 in. long ... 21. *S. Griffithii.*
Stem shorter; leaves narrower, more numerous, subrosulate; ·8–1·4 in. by ·4–·6 in., often beautifully variegated; petioles up to 1 in. long, very slender ... ... 22. *S. Cyclaminella.*

Leaves of each pair similar in shape, but very unequal in size or one quite suppressed. Stamens 6. Fruit as in Eu-Sonerila (§ Sonerilopsis, *Miq.*) ... ... 23. *S. heterostemon.*

Leaves of each pair very dissimilar in shape and size, one very small and more or less rotundate or reniform-cordate, often deciduous. Cymes usually from the axils of the small leaves, hence often apparently leaf-opposed. Anthers 3, oblong, obtuse, not over ·15 in. long. Fruit more or less turbinate or semiglobose, obscurely trigonous, usually conspicuously muricate ; valves not or very slightly exceeding the margin of the mature calyx, often not or indistinctly separating from each other at the periphery, but each of them always splitting into 2 membranous teeth in the depressed centre of the fruit. (§ Hexodon, *Stapf*) :—

Cymes distinctly, densely and persistently bracteate, distinctly and often long peduncled :—

Cymes simple or 2 or more, sessile on a common peduncle, forming a dense head :—

Cymes simple, at length 1–1·5 in. long ; leaves obliquely oblanceolate to obovate-oblong, 3–7 in. by 1–1·5 in. :—

Leaves fleshy, glabrous with the exception of the minutely strigillose nerves of the underside ... 24. *S. integrifolia.*

Leaves membranous, with rather long and spreading hairs beneath and along the margins ... 25. *S. bracteata.*

Cymes usually 2 or more, sessile on a common peduncle, very short, gathered in a dense head ; leaves obliquely obovate, elliptic or oblong, 4–6 in. by 1·75–3 in. ... ... 26. *S. capitata.*

Cymes usually 2 or more on a common peduncle, each with a special peduncle, gathered in a loose umbel ; leaves obliquely elliptic, 3–5 in. by 1·75–2·75 in. ... 27. *S. caesia.*

Cymes ebracteate, or indistinctly or deciduously bracteate :—

Cymes sessile or subsessile ; peduncle, if any, less than ·5 in., when mature ; fruit muricate :—

Cymes dense, indistinctly bracteate, sessile :—

Bracts linear, usually minute, or suppressed ; calyx pubescent ; leaves fleshy, firm when dry, glabrous above, shortly and adpressedly pubescent or tomentose beneath ... ... 28. *S. Nidularia.*

Bracts filiform, ciliate, hidden among long spreading hairs ; calyx shaggy ; leaves membranous, very hairy on both sides ... ... 29. *S. brachyantha.*

Cymes subsessile somewhat loose, ebracteate or deciduously bracteate :—

Leaves obliquely obovate-lanceolate to oblong, 2·5–6 in. by 1–2·5 in. :—

Leaves somewhat fleshy, firm, when dry with conspicuous transverse veins ; pedicels very

slender, to ·25 in. long; calyx with short, fine, spreading hairs; fruit ·08–·1 in. long, finely muricate ... ... 30. *S. microcarpa.*

Leaves membranous with conspicuous raised transverse veins; pedicels slender, ·08–·12 in. long; calyx with long spreading hairs; fruit ·15–·18 in. long, coarsely muricate ... ... 31. *S. costulata.*

Leaves obliquely elliptic, 4–6 in. by 2·2–3·5 in.; fruit ·2 in. long ... ... 32. *S. macrophylla.*

Cymes distinctly, often long, peduncled :—

Cymes 2 or more gathered in an umbel, or if simple, then with a pair of (often minute) leaves at the middle :—

Calyx hairy; fruit muricate :—

Cymes usually compound, minutely bracteate, axis shaggy; leaves more or less hairy all over 33. *S. paradoxa.*

Cymes usually simple, deciduously bracteate; bracts small; axis shortly hairy; leaves glabrous (in the Peninsular specimens) with the exception of the very shortly and scantily hairy nerves and veins of the underside ... 34. *S. begoniaefolia.*

Calyx glabrous; fruit smooth ... ... 35. *S. glabriflora.*

Cymes simple, ebracteate; peduncle naked :—

Softly hairy or tomentose all over :—

Leaves oblong-elliptic or obovate, 2·2–2·8 in. by 1–1·2 in., petals ·18 in. long ... ... 36. *S. elatostemoides.*

Leaves oblong to lanceolate-oblong, 3–6 in. by 1–1·5 in.; petals ·35 in. long ... ... 37. *S. bicolor.*

Shortly tomentose on stem, petioles and peduncles and pubescent on the nerves on the underside of the leaves, otherwise glabrous; fruit smooth ... ... 38. *S. Calycula.*

1. Sonerila epilobioides, Stapf and King. An erect, sparingly branched, almost quite glabrous herb, about 6 in. high. *Stem* with 2 prominent very minutely hairy lines or quite glabrous. *Leaves* of each pair similar in shape and equal or almost equal in size, ovate, acute or subacute, acuminate at the base, minutely toothed, thinly membranous, green, glabrous or with few scattered, soft, adpressed hairs above, 1–1·75 in. long by ·7–·9 in. broad, finely 5- (rarely 3-) nerved from the very base with a few delicate side nerves higher up; petiole ·4–·5 in. long, slender. *Cymes* terminal, peduncled, rather loosely 5–6-flowered, glabrous; peduncle ·6–·8 in. long, slender; pedicels at length up to ·2 in. long, very slender. *Calyx* very slender, obconical, ·25–·3 in. long; teeth broad, triangular, mucronulate. *Petals* elliptic-oblong, acuminate-apiculate, ·2 in. long, pink. *Anthers* subacute; ·12 in. long. *Style* filiform, ·12–·15 in. long; stigma subcapitate. Mature *fruit* unknown.

Kedah; Santow, on the limestone islands, *Curtis* 2114!

2. Sonerila calaminthifolia, Stapf and King. An ascending or almost prostrate branched herb, from a few inches to 1 ft. high, with very minute, spreading hairs all round or along the 2 commissural lines of the stem and branches, or glabrescent below and with scattered, adpressed, short, straight or flexuous hairs on the upper side of the leaves. *Stem* terete below, quadrangular in the upper part, purple, like the branches slender and often flexuous. *Leaves* petioled, rarely the uppermost subsessile and then sometimes apparently whorled, those of a pair similar in shape and size, symmetrical, oblong to elliptic-oblong, subobtuse, narrowed into the petiole, acutely toothed with the teeth usually mucronate and the margin revolute, rather stoutly membranous or almost fleshy, pale-green, purple along the midrib, ·3–·5 in. by ·15–·23 in., 1-nerved or with 1 very fine side-nerve on each side from near the base; petioles ·08–·12 in. or less. *Cymes* terminal, 2–5-flowered, ultimately lax or flowers solitary; peduncles filiform, ·4–·8 in. long; pedicels very slender, about ·08 in. long. *Calyx* slender, obconical-oblong, ·15–·2 in. long; teeth triangular, broad, acute. *Petals* elliptic, cuspidate, about ·33 in. long, pink. *Anthers* shortly acuminate, ·12–·17 in. long. *Style* filiform, ·2 in. long; stigma punctiform. *Fruit* oblong, subtrigonous, smooth, ·25–·3 in. by ·08–·1 in.

Perak; Gunong Batu Pateh, 4300 ft., *Wray* 1022!

3. Sonerila hyssopifolia, Stapf and King. An erect, simple or branched herb, 6–9 in. high, with two lines of short, curled hairs on the stem and branches, and with whitish, flexuous, longer hairs on the upper side of the leaves. *Stem* subterete below, quadrangular above. *Leaves* sessile or petioled, those of a pair similar in shape and size, lanceolate, subacute, cuneate at the base or the uppermost sessile and rounded at the base, symmetrical, minutely and somewhat remotely toothed with very acute or mucronate teeth, membranous, green, pale below, 1–1·75 in. by ·15–·3 in., indistinctly 3-nerved from near the base; petioles very variable in length, up to ·4 in. long, or 0. *Cymes* few-flowered, at length lax; peduncles ·8–1 in. long, very slender, pedicels very slender, ·04–·08 in. long. *Calyx* very slender, almost cylindric, ·24–·28 in. by ·04 in.; teeth triangular, mucronulate. *Petals* elliptic-oblong, acute, ·27 in. long, pink. *Anthers* acuminate, ·12–·18 in. long. *Style* filiform, about ·18 in. long; stigma subcapitate. *Fruit* trigonous-cylindric, slightly obconical at the base, ·5 in. by almost ·1 in.

Perak; Gunong Hijan; *Scortechini* 1426!

4. Sonerila erecta, Jack in Malay Misc. I, 7. A copiously branched herb, 1–1·5 ft. high, more or less hairy with the exception of the inflorescence, hairs flexuous, finely pointed, those of the stem and branches short, along 2 lines, those of the leaves longer, whitish, all over both surfaces. *Stem* subterete below, quadrangular above,

branched all along, branches more or less divaricate, 1 or, in luxuriant specimens, 2 from each leaf axil; often branched again. *Leaves* sessile or petioled, often apparently whorled on the upper or, in vigorous specimens, almost on all nodes, those of a pair similar in shape and size, lanceolate or ovate, acute or subacute, contracted or subcuneate at the base, rather symmetrical, entire or minutely toothed, membranous, green or greyish when very hairy, ·4–1·2 in. by ·2–·4 in., indistinctly 3-nerved from near the base; petioles slender, very variable in length, up to ·3 in. long, or 0. *Cymes* 2–9-flowered, at length very lax; peduncles filiform, ·4–2 in. long; pedicels very slender, ·04 in. long or hardly any. *Calyx* very slender, almost cylindric, ·15–·2 in. by ·03 in., teeth triangular, short. *Petals* elliptic-oblong, cuspidate-acuminate, ·15 in. long, pink. *Anthers* ovate-lanceolate, acute or subacute, ·06–·09 in. long. *Style* filiform, ·12 in. long; stigma punctiform. *Fruit* almost cylindric, slightly trigonous, smooth, ·3–·45 in. by ·06–·08 in. Jack in Hook. Bot. Misc. II, 63; Blume in Flora (1831), 491; Benn. Pl. Jav. Rar. 217; Naud. in Ann. Sc. Nat. Ser. 3, XV, 324; Miq. Fl. Ind. Bat. I, 563; Triana in Trans. Linn. Soc. XXVIII, 75; C. B. Clarke in Hook. f. Fl. Brit. Ind. II, 530; Cogn. in DC. Monogr. VII, 492; Stapf in Ann. Bot. VI, 304.

Penang; Government Hill, *Curtis*, *Porter* in Wall. Cat. 4092; *Maingay* 2214 (778, Kew Distrib.). Distrib. Northwards as far as Moulmein.

Var. *flexuosa*, Stapf and King. *Stems* ascending, like the very slender branches more or less flexuous. *Leaves* lanceolate to linear-lanceolate, acuminate at the base, ·4–·8 in. by ·12–·2 in., more or less pubescent or scaberulous from very short hairs, mainly above, margins usually finely but sharply toothed and often revolute. *Cymes* 3–1-flowered with capillary peduncles. *Fruit* ·27–·35 in. long, by ·6–·8 in.

Penang; on rocks, 2000 ft., *Curtis* 1238! Perak; Larut, on rocks in rich, moist soil, 300 to 600 ft., *Kunstler* 2364! *Scortechini* 91!

Var. *discolor*, Stapf and King. *Stems* ascending or erect, branches very slender, slightly flexuous, very minutely hairy along lines or almost glabrous. *Leaves* oblong-lanceolate to ovate-lanceolate, minutely toothed, narrowly revolute on the margins, very pale beneath, 3–5-nerved near the base, nerves fine, but rather distinct. *Cymes* 4–1-flowered, rather congested, also when mature. *Anthers* ·08–·09 in. *Fruit* oblong-cylindric, ·3–·35 in. by ·08 in.

Perak; *Scortechini* 160!

5. Sonerila tenuifolia, Blume in Flora 1831, 491. An erect or ascending, branched or unbranched herb, 6–12 in. high, usually with scattered, spreading, gland-tipped hairs in the upper part of the stem, on the peduncles and pedicels, and near the mouth of the calyx and with few

adpressed, finely attenuated, pale hairs on the upperside of the blades, rarely almost quite glabrous. *Stem* slender, terete below, more or less quadrangular upwards. *Leaves* of a pair similar in shape, but unequal in size, ovate to ovate-lanceolate, long acuminate, symmetrical or slightly asymmetrical and rounded at the base, acutely and coarsely toothed, thinly membranous, dark- or pale-green, the larger 1–2 in. by ·4–1 in., distinctly 3-, rarely 4–5-nerved from the very base, very faintly pinnate-nerved higher up; petioles very slender, reaching 1·5 in. in length, purple. *Cymes* 1–6-flowered, almost pseudo-umbellate; peduncle ·5–1 in. long, like the slender pedicels purple or crimson, the latter ·25–·3 in. long. *Calyx* campanulate-oblong to ovoid-oblong, about ·15 in. long; teeth distinct, triangular. *Petals* elliptic, apiculate, ·3–·35 in. long, glabrous, rose-coloured. *Anthers* lanceolate-acuminate, acute or subobtuse, ·12–·13 in. long. *Stigma* capitate. *Fruit* trigonous, obconical, ·23–·27 in. long, smooth; valves ·23 in. broad. Benn. Pl. Jav. Rar. 211, t. 44; Naud. in Ann. Sc. Nat. ser. 3, XV, 324; Miq. Fl. Ind. Bat. I, 563. Triana in Trans. Linn. Soc. XXVIII, 76; C. B. Clarke in Hook. f. Fl. Brit. Ind. VIII, 536. Stapf in Trans. Linn. Soc. 2nd Ser. IV, 156; Cogn. in DC. Monogr. VII, 502; Stapf in Ann. Bot. VI, 301.

PERAK; *Scortechini* 312! *Kunstler* 722! *Wray* 427! on Gunong Batu, 4500 ft., *Wray* 273! 406. MALACCA; Mt. Ophir, *Maingay* 2582! DISTRIB. Sumatra, Java, Borneo.

VAR. *hirsuta*, Stapf and King. Leaves hairy on both sides; hairs copious at least above, longer, wavy or curled, less adpressed than in the type; blades often very small (0·6 in. by 0·3 in.); flowers solitary.

PERAK; *Scortechini* 790! Larut, top of Gunong Bubu, 5000-5300 ft., *Kunstler* 7406! *Wray* 3841!

6. SONERILA FLACCIDA, Stapf and King. An erect or ascending, usually branched herb, ·5–1 ft. high, with a very fine, furfuraceous, dark rusty and often scanty indumentum in the lower part and on the underside of the leaves (at least on the nerves), otherwise glabrous. *Stem* quadrangular. *Leaves* of a pair similar, equal or unequal in size, oblong or oblong-elliptic, subacute or subacuminate at both ends, or the tips obtuse, sometimes decurrent at the base, entire or nearly so, symmetrical or more or less asymmetrical, thinly membranous, dark- or light-green and often spotted with white circular or elliptic spots above, whitish green beneath, 2–4 in. by ·75–1·75 in., pinnate-nerved, distinct side-nerves usually 3 on each side, the others like the tertiary nerves very faint or quite obscure; petiole up to ·6 in. long, often very short, slender. *Cymes* terminal and axillary, short, few- to 9-flowered, peduncled, peduncle very slender, ·75–1 in. long; pedicels very slender, ·08–·15 in. long. *Calyx* slender, obconical to oblong, ·13–·15 in. long, rose-coloured, teeth triangular, very short and broad. *Petals* oblong, acute, ·15 in.

long, rose-coloured. *Anthers* acute, ·12 in. long. *Style* filiform; stigma capitate. *Fruit* trigonous, truncate-obovate, ·2 in. long, smooth; valves ·12 in. broad.

PERAK; Gunong Panti, 600–800 ft., *Kunstler* 219! *Ridley* 4184! Gunong Inas, 3500 ft., *Wray* 4066! 4067!

Certain small specimens, collected by Scortechini in Perak (272), represent only a dwarf state of *S. flaccida;* their larger leaves measure 1–1·5 in. by ·6–·8 in.

7. SONERILA ANDAMANENSIS, Stapf and King. An erect or ascending, branched or unbranched herb, 3–6 in. high, more or less hirsute, particularly on the stem and petioles, with flexuous, finely pointed hairs. *Stem* reddish-brown when dry, quadrangular. *Leaves* rather approximate, those of a pair similar in shape and size, or more or less unequal, ovate to ovate-oblong, acute or subacuminate, rounded or subcordate and often slightly asymmetrical at the base, membranous, green or purple above, purplish glaucous below, length 1·5 to 3·3 in., breadth 1 to 1·7 in., 5–8-nerved from below the middle, the lower nerves more or less opposite, the uppermost 1 or 2 usually alternate, transverse veins oblique, fine or obscure; peduncle ·5–1·5 in. long. *Cymes* few- to many-flowered, much contracted, peduncles solitary and terminal, or 2–4 from the top and the uppermost leaf-axils, 1–2 in. long; pedicels slender, up to ·1 in. long, like the flowers with scanty and sometimes minutely gland-tipped hairs. *Calyx* very slender, obconical, up to ·2 in. long; teeth short, broad, triangular. *Petals* elliptic, acuminate, ·25 in. long, rose-coloured. *Anthers* ovate-lanceolate, subacute, ·09–·12 in. long. *Style* filiform, ·2–·25 in. long; stigma capitate. *Fruit* oblong with a cuneate base, ·22–·27 in. long, smooth; valves scarcely ·1 in. broad.

ANDAMANS; Mount Harriet near Port Blair, on rocks, *King's Collector* 48!

8. SONERILA POPULIFOLIA, Stapf and King. An erect or ascending, simple or sparingly branched herb, 6–9 in. high, more or less covered with minute hairs and with a few soft, adpressed, whitish, small bristles on the surface and the margins of the ultimately often glabrescent leaves, with the hairs of the inflorescence often minutely gland-tipped. *Stem* finely rusty-tomentose, subterete below, quadrangular above. *Leaves* of a pair similar in shape and equal or somewhat unequal in size, ovate, acute or acuminate, usually minutely cordate at the base, with the lobes often more or less unequal and close, subentire or toothed in the upper part, thinly membranous, light-green, 1·5–3 in. by 1·2–1·75 in., finely 7-nerved from near the base, upper pair ·2–·3 in. from the base; petioles very slender, 1–2 in. long, finely tomentose. *Cymes* few- to 12-flowered, much contracted and almost umbelliform, terminal; peduncle slender, ·5–1·2 in. long; pedicels slender, ·15–·22 in. long.

Calyx subcampanulate-oblong, ·18–·2 in. long; teeth broad, triangular. *Petals* elliptic, shortly acuminate, ·3–·4 in. long, deep- to blueish-pink. *Anthers* acuminate, tips sometimes very fine and curved, ·2–·3 in. long. *Style* filiform, ·35–·45 in. long; stigma minutely capitate. *Fruit* trigonous, truncate-obovoid, ·2–·25 in. long, smooth, often finely puberulous; valves ·15–·16 in. broad.

Perak; *Scortechini* 136! 300–500 ft., *King's Coll.* 10055! Larut, dense jungle, 500–800 ft., *King's Coll.* 5791! Briah plains, *Wray* 4201! Tapah, *Curtis!*

The uppermost pair of leaves is often much reduced, resembling a pair of bracts. One of the leaves of the preceding pair is sometimes suppressed, whilst the peduncle and the petiole of the other leaf are so turned that the latter seems to form the continuation of the axis; hence the former appears to spring from a long petiole. This is chiefly the case with the inflorescences which terminate branches.

9. Sonerila pallida, Stapf and King. An ascending, branched or unbranched herb, 6–12 in. high, hirsute all over, but chiefly on the stems and petioles, hairs pale reddish when dry, those of the inflorescence short, stiff and spreading. *Stem* decumbent at the base, rooting in the lower part, quadrangular. *Leaves* of a pair similar in shape, but usually rather unequal in size, oblong to ovate-oblong, acuminate, symmetrical or more or less asymmetrical and acute (rarely obtuse) at the base, minutely denticulate, membranous, light green, the larger 1·5–4 in. by ·8–1·8 in., finely but distinctly 5–7-nerved from near the base, the upper pair ·4–·6 in. from the base, petioles up to ·6–·75 in. long. *Cymes* few- to 8-flowered, short, on apparently terminal peduncles; peduncles slender, 1–2 in. long; pedicels ·08–·15 in. long, slender. *Calyx* slender, trigonous, obconical-campanulate, ·15–·2 in. long; teeth distinct, triangular. *Petals* elliptic-oblong, apiculate, ·45–·5 in. long, with a line of short, stiff, spreading hairs on the back, pale pink. *Anthers* acuminate, slender, ·23–·24 in. long. *Style* filiform, stigma punctiform. *Fruit* trigonous, obconical, ·25–·3 in. long, sparingly muricate, valves ·15 in. broad.

Perak; Gunong Inas, 5000 ft., *Wray* 4100! Malacca; Bujong, *Curtis* 3155! Selangore; Bukit Hitam, 2500–3500 ft., *Kelsall! Ridley* 7320!

10. Sonerila rudis, Stapf and King. A semidecumbent, sparingly branched or unbranched herb, about 1 ft. high, densely clothed with short, or often very long, fine and spreading, curved or curled hairs on the stem and petioles, with somewhat coarse, more or less adpressed hairs on both sides of the leaves and gland-tipped, spreading hairs on the peduncles, pedicels, calyx and the midrib of the petals, hairs reddish when dry. *Stem* often rooting in the lower part, terete or subquadrangular

in the upper part. *Leaves* of a pair similar, subequal or rather different in size, ovate to oblong or elliptic, acute or subacuminate, rounded at the base, entire, somewhat fleshy, green above, pale beneath, distinctly 7-nerved from near the base (upper pair ·2–·25 in. above the base); petioles ·4–1·2 in. long. *Cymes* 2–6-flowered, umbelliform, terminal, peduncled; peduncle slender, ·5–1 in. long; pedicels ·08–·1 in. long. *Calyx* rather slender, subcampanulate, ·12–·15 in. long; teeth short, broad, triangular. *Petals* elliptic to obovoid, obtuse or subacute, ·5–·6 in. by ·35–·4 in., pink, with a line of gland-tipped hairs on the back. *Anthers* acuminate, slender, ·23–·27 in. long. *Style* filiform; stigma punctiform. *Fruit* trigonous, shortly obconical, about ·27 in. long, muricate, on stout muricate pedicels; valves ·2 in. broad.

Perak; *Scortechini!* Tumbung Parbat, *Scortechini* 422! Gunong Batu Pateh, 4500 ft., *Wray* 260. Malacca; Bujong, *Curtis* 3297!

11. Sonerila mollis, Stapf and King. An ascending, sparingly branched or unbranched herb, about 1 ft. high, densely and adpressedly tomentose along stem and petioles, and on the underside of the leaves along the nerves, and besides almost cobwebby on both sides of the young leaves; all the hairs soft and reddish when dry. *Stem* often rooting in the lower part, terete or subquadrangular in the upper part. *Leaves* of a pair similar, but differing more or less in size, elliptic to ovate-elliptic, shortly and acutely acuminate, rounded at the base, entire, somewhat fleshy, very dark green and quite glabrous above when adult, pale and glabrescent beneath between the nerves, the larger 2–3 in. by 1–2 in., distinctly 5–7-nerved from near the base (upper pair of side nerves ·25–·27 in., distant from the base); petioles ·4—1 in. long. *Cymes* 2–4-flowered, umbelliform or flowers solitary, terminal, peduncled, glabrous; peduncle about ·5 in. long, slender; pedicels ·2–·24 in. long, very slender. *Calyx* slender, subcampanulate, ·18–·2 in. long; teeth very short and broad, triangular. *Petals* elliptic-oblong, acute, ·4 in. long. *Anthers* acuminate, ·2–·22 in. long. *Style* filiform; stigma punctiform. *Fruit* trigonous, shortly obconical, ·24 in. long, smooth; valves ·2–·24 in. long.

Perak; *Wray*, *Scortechini!* Summit of Gunong Batu Pateh, 6700 ft., *Wray* 375!

12. Sonerila albiflora, Stapf and King. An ascending or suberect, more or less branched herb, 9–12 in. high, densely and adpressedly hirsute along stem and petioles and more sparingly on the underside of the leaves, and with gland-tipped spreading hairs on pedicels, calyx and midrib of petals. *Stem* rather slender, terete or subquadrangular in the upper part. *Leaves* of a pair similar and rather equal in size, lanceolate to ovate- or obvate-lanceolate, acute or subacuminate at both ends, entire or almost so, fleshy, very dark green (almost black when

dry) and glabrous above, pale and adpressedly hairy beneath (at least on the nerves), 1–3 in. by ·5–1·25 in., distinctly 3–5-nerved from near the base; petioles ·2–·4 in. long. *Flowers* axillary and terminal, solitary or paired; pedicels ·1–·2 in. long, slender. *Calyx* subcampanulate, ovoid, ·1 in. long; teeth distinct, broadly triangular. *Petals* oblong, apiculate, ·2 in. long, white, with a line of gland-tipped hairs beneath. *Anthers* oblong, obtuse, ·08–·1 in. long. *Style* slightly and gradually thickened upwards; stigma punctiform. *Fruit* trigonous, shortly obconical, ·2 in. long, very scantily muriculate; valves ·2 in. broad.

Perak; *Scortechini* 1886! Gunong Kledang, 1000 ft., *Curtis* 3293! *Ridley* 9691! *Goldham*! Kinta in dense jungle, 3500–4000 ft., *King's Collector* 7169!

13. Sonerila lasiantha, Stapf and King. An erect herb, 4–6 in. high, hirsute all over with flexuous, finely pointed, rufous hairs. *Stem* terete, with the hairs more or less adpressed. *Leaves* of a pair similar in shape, very unequal in size, obliquely lanceolate or subovate, acute, attenuated at the base, membranous, green above, pale beneath, the larger 1·5–3 in. by ·6–·8 in., with 2–3 side-nerves in the broader and 1 in the narrow half, the uppermost ·75–1 in. above the base; petiole slender, ·3–·6 in. long. *Fascicles* few-flowered, terminal and axillary, subsessile; pedicels rather stout, ·1–·15 in. long. *Calyx* obconical, densely hirsute, ·15–·18 in. long. *Petals* oblong, cuspidate-acuminate, ·12 in. long. *Anthers* oblong, subacute, ·06 in. long. *Style* filiform, rather stout; stigma punctiform. *Fruit* broad, obconical, muricate, to ·25 in. long; valves ·18–·2 in. broad.

Perak; Gunong Bubu, *Wray* 3863! (in part).

The specimen which we have here in view is so different in habit and in the size of the comparatively long peduncled leaves from the others bearing the same number in Wray's collection, but described under *S. suffruticosa*, that we believe ourselves justified in considering it for the present as a distinct species.

14. Sonerila suffruticosa, Stapf and King. An erect, repeatedly branched half-shrub, over 1 ft. high, shaggy all over from coarsely adpressed, crimson (reddish, when dry) hairs, or glabrescent at length at the base. *Stem* terete, woody below, hollow. *Leaves* mainly crowded near the tips of the branches, those of a pair similar in shape, but rather unequal in size, oblong to ovoid-oblong, acute, more or less asymmetrical or almost symmetrical and acute at the base, obscurely serrate or toothed, thickly membranous, dark green above, paler beneath, the larger 1–1·4 in. by ·4–·6 in., 3–5-nerved from near the base; petioles ·25 in. long to very short. *Flowers* unknown (petals white according to Wray). *Fruits* axillary, solitary or in pairs on stout short pedicels, obconical, ·2 in. long, strigose from tubercle-based hairs, or muricate from their persistent bases; valves ·12 in. broad.

Perak; Larut, Gunong Bubu, 5000 ft., *Wray* 3863! (in part).

15. Sonerila elliptica, Stapf and King. An erect or ascending, usually unbranched herb, 6–9 in. high, with a very fine, furfuraceous, dark-rusty indumentum in the lower parts and on the young leaves, glabrous or soon glabrescent higher up. *Stem* somewhat stout and succulent, terete. *Leaves* of a pair similar in shape, slightly unequal or equal in size, broadly elliptic, rarely ovate or almost orbicular, very obtuse, usually symmetrical and rounded or subcordate at the base, minutely and inconspicuously toothed, thick, fleshy, dark-green, often mottled with white along the nerves above, waxy yellowish-green beneath, 1–2·5 in. by ·75–2 in., distinctly 5-nerved from the very base, upper nerves usually quite indistinct; petioles 1–2 in. long. *Cymes* many-flowered, dense, axis at length up to ·75 in. long; peduncle slender, 1–2·5 in. long, pedicels at length up to ·2 in. long. *Calyx* obconical, trigonous, ·12 in. long, glabrous, teeth distinct, broad, triangular. *Petals* oblong, apiculate, ·2–·23 long, glabrous, pinkish white. *Anthers* oblong, obtuse, scarcely ·1 in. long. *Stigma* punctiform. *Fruit* trigonous, obconical, ·15 in. long, smooth; valves ·12 in. broad.

Perak; Kinta, on limestone rocks, 500–800 ft., *Kunstler* 7037! 7225! Sungie Siput, *Curtis* 3156!

16. Sonerila succulenta, Stapf and King. A succulent, erect herb, quite glabrous with the exception of a very few gland-tipped hairs on the calyx. *Stem* stout, very short to 3 in. long, very fleshy. *Leaves* few, crowded, of a pair equal, symmetrical or almost so, long-petioled, elliptic to ovate-elliptic, rather long and acutely acuminate, rounded at the base or very slightly subcordate, entire, very thinly membranous when dry, 6–7 in. by 3–4 in., 7-nerved from the base, with lax, subhorizontal transverse nerves, petioles succulent, 2–4 in. long. *Cymes* terminal and axillary, 2–5 on a long common peduncle, subebracteate, rather few-flowered, very short and dense; common peduncle stout, 4–7 in. long; special peduncles 1 to over 3 in. long, bracts very minute, subulate, the lower soon deciduous; pedicels hardly any. *Calyx* oblong-campanulate, up to ·25 in. long; teeth short, triangular. *Petals* oblong, cuspidate-acuminate, ·18 in. long. *Anthers* long-acuminate, incurved, over ·25 in. long. *Style* ·35 in. long; stigma subcapitate. *Fruit* subtrigonous, obconical, smooth, up to ·25 in. long; valves over ·15 in. broad.

Perak; Maxwell's Hill, 3000 ft., *Scortechini* 279!

17. Sonerila repens, Stapf and King. A herb with a long creeping rhizome and a very short succulent stem bearing 2–3 usually much approximated pairs of leaves, with few, whitish, more or less adpressed, papilliform hairs on both sides of the leaves and with very few, minute, gland-tipped hairs on the stems, petioles and inflorescences, or glabrous with the exception of the leaves. *Leaves* of a pair similar in shape,

equal or, more usually, very unequal in size, ovate, rarely oblong, acutely acuminate, cordate, rounded or rarely subacute at the base, rather symmetrical, entire or slighty wavy and denticulate, thinly membranous, dark- or pale-green, the larger 3–7 in. by 2–4·5 in., distinctly 7-nerved from the very base, with somewhat distant transverse veins; petioles 1–2·5 in. long, slender or stout, fleshy. *Cymes* long-peduncled, often many-flowered, solitary or usually 2–4 on a common subterminal peduncle from the leaf axils or close to the top; peduncle 2–5 in. long, first slender, at length rather stout, pedicels slender, ·1–·12 in. long. *Calyx* slender, obconical-campanulate, ·2 to ·23 in. long; teeth triangular. *Petals* elliptic, acute, ·2–·25 in. long, white or greenish white. *Anthers* slender, acuminate, ·23–·27 in. long. *Style* filiform; stigma punctiform. *Fruit* trigonous, obconical with straight sides, ·22–·3 in. long, smooth; valves ·15–·16 in. long.

Perak; 2000–4000 ft., common, *Curtis* 2015! *Scortechini* 1911! Maxwell's Hill, *Scortechini* 18/*a*! *Ridley*! Larut, on rocks in dense jungle, 2000 ft., *Kunstler* 2005! in open jungle on hill sides, 500–800 ft., *King's Collector* 5152! Kinta, *Curtis*! Malacca; Bujong, 3000 ft., *Curtis*!

18. Sonerila muscicola, Stapf and King. A flaccid, ascending, unbranched herb, 4–6 in. high, with a creeping rhizome, with pale, fine, curved or curled hairs in the upper part of the stem and the leaves, and with scanty, gland-tipped hairs on the pedicels, calyx and on the back of the petals. *Stem* slender, weak, quadrangular. *Leaves* of a pair similar in shape and size, oblong to lanceolate-oblong, subacute or subacuminate at both ends, symmetrical or almost so, minutely toothed or almost entire, thinly membranous, pale-green, 2–3·7 in. by ·8–1·4 in., pinnate-nerved, nerves 3–4 on each side, fine, very oblique; petiole ·3–·8 in. long. *Cymes* few-flowered, terminal, peduncled, umbelliform, peduncles very slender, 1–1·5 in. long; pedicels very slender, ·08–·12 in. long. *Calyx* slender, obconical-campanulate, ·2 in. long; teeth triangular, broad. *Petals* elliptic, apiculate, ·35–·4 in. long, pink, with a few gland-tipped hairs along the middle nerve beneath. *Anthers* very slender, acuminate, tips curved, ·22–·24 in. long. *Style* filiform; stigma punctiform. *Fruit* trigonous, truncate-obovoid, ·2 in. long, smooth; valves ·12 in. broad.

Kedah; Gunong Raya, on mossy trees, *Curtis* 2573!

19. Sonerila saxosa, Stapf and King. An erect, delicate herb, 2–4 in. high, scantily hairy with the exception of the glabrous flowers, hairs pale, flexuous with long, fine tips; with a slender, creeping rhizome. *Stem* very slender, quadrangular. *Leaves* in 3–4 pairs (of which the upper are rather close), those of a pair similar in shape and size, oblong-lanceolate to lanceolate, acute at both ends, rather symmetrical,

finely toothed in the upper part or almost entire, membranous, green above, purplish beneath, ·8–1·7 in. by ·3–·6 in., 5–7-nerved from below the middle; petiole ·2–·3 in. long. *Cymes* 4–7-flowered, much contracted, terminal; peduncles very slender, ·5–1·5 in. long; pedicels very slender, ·15 in. long, glabrous. *Calyx* very slender, linear-subcampanulate, ·15 in. long, teeth broad, triangular. *Petals* elliptic, acuminate, cuspidate, ·3–·35 in. long, pink. *Anthers* acuminate, ·19 in. long. *Style* filiform, ·3 in. long; stigma punctiform. *Fruit* obconical, truncate, sides almost straight, passing into the thickened pedicel, ·25 in. long; valves ·12–·15 in. broad.

Penang; Government Hill, 2500 ft., on rocks in damp shady ravines; *Curtis!*

20. Sonerila congesta, Stapf and King. An erect or suberect, rather delicate herb, 3–3·5 in. high, quite glabrous with the exception of an extremely scanty, furfuraceous, dark-rusty indumentum in the lower part; with a slender, creeping rhizome. *Stem* 1–1·5 in. long (exclusive of the peduncle), quadrangular. *Leaves* in about 3 crowded pairs, those of a pair similar in shape and size, broad, ovate to elliptic, obtuse or subobtuse, rounded or obscurely cordate at the base, rather symmetrical, subentire, thinly membranous, green, ·9–1·7 in. by ·6–1·2 in., 5–7-nerved from near the base, upper pair ·4–·6 in. from the base; petiole slender, ·6–·7 in. long. *Cymes* 4–9-flowered, contracted; peduncles slender, 1·2 in. long; pedicels slender, ·12–·15 in. long. *Calyx* slender, subcampanulate-oblong, ·15 in. long; teeth triangular, short. *Petals* elliptic-oblong, cuspidate-acuminate, ·35 in. long, pink. *Anthers* acuminate, ·15–·2 in. long. *Style* filiform, ·25–·3 in. long; stigma punctiform. *Fruit* (semi-mature) obovoid-oblong, ·15 in. long.

Kedah; Gunong Chinchang, *Curtis* 2572!

21. Sonerila Griffithii, C. B. Clarke in Hook. f. Fl. Brit. Ind. II, 539. An ascending, delicate herb, quite glabrous with the exception of the margins and sometimes the upper surface of the leaves; with a rather stout rhizome. *Stems* very slender, 2–3 in. long (exclusive of the panicle), rooting from the lower, soon leafless nodes, quadrangular. *Leaves* in 3-4, often crowded pairs, those of a pair similar in shape and size, broad, ovate to rotundate-elliptic, obtuse or subobtuse, obscurely cordate, rarely subobtuse at the base, rather symmetrical, toothed and ciliate on the margin, membranous, green, ·4–·8 in. by ·4–·6 in., 5-nerved from near the base, upper pair ·1 in. from the base; petioles slender, ·3–·5 in. long. *Cymes* 2–3-flowered, much contracted, peduncles slender, 1–2·2 in. long; pedicels very slender, ·1 in. long. *Calyx* slender, subcampanulate-oblong, ·12 in. long; teeth triangular-ovate. *Petals* elliptic-oblong, cuspidate-acuminate, scarcely ·25 in. long, pink. *Anthers* acuminate, ·12–·15 in. long. *Style* filiform, not quite ·25 in. long; stigma

punctiform. *Fruit* truncate, obovoid-oblong, cuneate at the base when quite ripe, ·19–·23 in. long, obtusely trigonous. Cogn. in DC. Mon. VII, 513; Stapf in Ann. Bot. VI, 308.

Malacca; Mt. Ophir, on dripping places, *Griffith* 2300! *Maingay* 2583! *Lobb* 182.

22. Sonerila Cyclaminella, Stapf and King. A rather delicate, perfectly glabrous, almost acaulescent herb, with a creeping rhizome. *Stem* usually extremely short, quadrangular. *Leaves* in about 4 pairs, almost crowded into a rosette, those of a pair similar in shape and size, ovate to oblong-obtuse or subobtuse at both ends or subcordate at the base, rather symmetrical, undulate-crenulate or almost entire, membranous, light or dark brownish green above with silvery bands along the midrib and often also along the side, nerves more or less rich violet underneath, ·8–1·4 in. by ·4–·6, distinctly although finely 5–7-nerved below the middle, often with 1 or 2 delicate side-nerves higher up; petioles slender, ·4–1 in. long. *Cymes* 2–5-flowered, very much contracted; peduncles slender, 2–5 in. long, pedicels slender, ·08–·1 in. long. *Calyx* slender, subcampanulate-oblong, ·12–·15 in. long; teeth triangular, short. *Petals* elliptic, cuspidate-acuminate, scarcely ·25 in. long, light pink. *Anthers* acuminate, ·12 in. long. *Style* filiform, ·25 in. long; stigma minutely subcapitate. *Fruit* truncate, obovoid, obtusely trigonous, ·12–·16 in. long.

Perak; on rocky hilltops, 800–1000 ft., *King's Collector* 10745! 10746! 10744 (in part)!

Var. *canescens*, Stapf and King. Leaves more or less covered above with long, flexuous, white hairs; some of Ridley's specimens have leaves up to 3 in. by 1·2 in.

Perak; with the type; *King's Collector* 10744 (in part)! Selangore; Bukit Kinta, 3000 ft., on rocks, *Ridley* 7318!

23. Sonerila heterostemona, Naud. in Ann. Sc. Nat. Ser. 3, XV, 326, t. XVIII, fig. 4. An erect or ascending, often branched herb, ·5–2 ft. high, rarely quite dwarf, quite glabrous apart from an extremely fine, furfuraceous, rusty indumentum in the younger parts and, occasionally, a few scattered, short, whitish hairs on the upper surface of the leaves. *Stem* somewhat stout, quadrangular. *Leaves* of a pair similar in shape, but usually very unequal or one arrested at a very early stage or quite suppressed, rarely both more or less equal, usually conspicuously asymmetrical, obliquely ovate, subacute or shortly acuminate, rounded or shortly narrowed at the base, minutely toothed, membranous, metallic green, often spotted above, purplish beneath on the nerves, 1·5–4·5 in. by 1–2·3 in., 5-6-nerved from the very base with fine, lax, more or less horizontal transverse veins; petioles very unequal in length, ·5–2 in. long. *Cymes* axillary and terminal, much contracted

and compact, very many-flowered, distinctly bracteate, at length 1–2.5 in. long, peduncle ·6–1·2 in. long; bracts spathulate or obovate, very obtuse, up to ·2 in. long, persistent; pedicels hardly any. *Calyx* short, obconical-oblong, ·15–·16 in. long; teeth obscure, very obtuse. *Petals* elliptic, obtuse, pink, ·15 in. long. *Stamens* 6, 3 slightly curved, purple, ·15 in. long, 3 straight or almost so, yellow, ·12–·15 in. long. *Fruit* subsessile, turbinate, ·19–·23 in. long; valves ·19 in. broad. Miq. Fl. Ind. Bat. I, 565; Triana in Trans. Linn. Soc. XXVIII, 77; C. B. Clarke in Hook. f. Fl. Brit. Ind. II, 540. *S. obliqua*, Cogn. in DC. Monogr. VII, 515; and Stapf in Ann. Bot. VI, 310 (in part), not of Korth.

Perak; *Scortechini!* Ipoh, *Curtis* 3158! Changkal Serdang, *Wray* 783! Larut, *Scortechini* 54/*a*! Goping, *Kunstler* 787! Tapa, *Wray* 1308. Malacca; *Griffith* 2302! 2294! *Maingay* 1223! (782, Kew Distr. partly), *Cuming* 2349! *Lobb* 183! in dense forest between Jassing and Ayer Bombon, *Maingay* 1425! (782, Kew Distrib. partly). Malacca; Batang, *Holmberg* 876! Ulu Gujah, *Harvey!* (dwarf specimens). Singapore; *Maingay* 3098! (782, Kew Distrib. partly); Bukit Timah, *Hullet* 893! Pahang; Tahan, *Ridley!* (dwarf specimens). Distrib. Sumatra to Borneo.

24. Sonerila integrifolia, Stapf in Ann. of Bot. VI, 312. An erect or ascending, simple or branched herb, ·5–1·3 ft. high, rufously strigose on the stem, the petioles, the nerves on the underside of the leaves and the inflorescence, including the calyx, but exclusive of the bracts, hairs of the leaves very tightly adpressed, like those of the inflorescence very short. *Stem* rather robust, often swollen at the nodes, subflexuous, almost woody below. *Leaves* very dissimilar, the larger of a pair asymmetrical, rarely symmetrical, usually obliquely oblong-lanceolate to obovate-oblong, distinctly (sometimes long) acuminate, minutely cordate or acute at the base, entire, sometimes with slightly wavy margins, somewhat fleshy, soft, quite glabrous above, dark- or yellowish-green, 3–5 in. by 1–1·5 in., sub-5-nerved from near the base with the lowermost pair of nerves faint, and the uppermost (in the narrow half) ·2–1·2 in. above the base, with fine oblique transverse veins; small leaves minute, ovate to rotundate, often cordate, sessile or shortly petioled. *Cymes* terminal and apparently leaf-opposed, peduncled, bracteate, few- to many-flowered, very dense, up to 1 in. long, peduncles very short to ·5 in. long; rhachis often flexuous when long; bracts oblong to linear-lanceolate, fleshy, up to ·12 in. long, often much smaller, sometimes extremely numerous and crowded; pedicels very short or 0. *Calyx* oblong-campanulate, nearly ·1 in. long; teeth triangular, up to ·04 in. long, acute. *Petals* oblong, acute, ·15 in. long, white to pink. *Anthers* oblong, obtuse, almost ·1 in. long. *Style* ·2 in.

long; stigma punctiform. *Fruit* semiglobose-turbinate, ·12–·18 in. long and wide, bullate-muricate.

Perak; Larut, 200–800 ft., *Kunstler* 1917! 2791! Changkal Serdang, *Wray* 755! Blanda Mobok, *Wray* 3954! Maxwell's Hill, *Scortechini* 16*a*! Hermitage, *Curtis* 1302! Selangor; Dusun Tua, *Ridley* 7334! Kwala Tampan Caves, *Ridley* 306!

Var. *acuminatissima*, Stapf and King. Leaves mostly very long and finely acuminate, on the whole narrower and less asymmetric than in the type, margins often slightly wavy to remotely serrulate, not rarely with a row of white spots close to them. *Petals* white.

Perak; Larut, 1800–4000 ft., in dense old jungle, *Kunstler* 2004! 2161!

25. Sonerila bracteata, Stapf and King. An erect or ascending, unbranched or very scantily branched herb, ·5–1·5 ft. high, softly and densely hirsute to tomentose from rufous, flexuous or curved, more or less spreading, fine hairs in all parts with the exception of the upper side of the leaves which is glabrous apart from scattered, adpressed, pale bristles. *Stem* rather stout below with swollen nodes, subflexuous, leafy part 2 to over 6 in. long. *Leaves* very dissimilar, the larger of a pair shortly petioled, somewhat asymmetrical, oblanceolate, long and finely acuminate, unequally cordate at the base with a small rounded lobe on the outer, and a still smaller or obscure lobe on the inner side, entire, ciliate along the margin, membranous, light-green, 3–7 in. by 1–1·7 in., 5-nerved from near the base (the uppermost nerve ·5–1·5 in. above the base), with oblique, transverse veins; petioles ·2 to ·4 in. long; small leaves reniform, very minute or up to ·3 in. in diam. *Cymes* terminal and axillary, long-peduncled, very dense, subcapitate at first, at length to 1·5 in. long, multibracteate, many-flowered; peduncle rather slender, up to 2 in. long; bracts linear, membranous, ciliate, up to ·12 in. long; pedicels very short. *Calyx* shortly oblong-campanulate, ·07–·08 in. long; teeth lanceolate-triangular, about ·04 in. long. *Petals* oblong, cuspidate-acuminate, white, ·08 in. long, with a line of gland-tipped hairs on the back. *Anthers* short, oblong, obtuse, ·06–·07 in. long. *Style* ·15 in. long; stigma punctiform. *Fruit* shortly turbinate, ·15 in. long and wide, densely muricate.

Perak; Larut, in dense old jungle, 3200–3500 ft., *Kunstler* 2133! Maxwell's Hill, *Scortechini* 12!

26. Sonerila capitata, Stapf and King. An ascending, unbranched or scantily branched herb, 3–12 in. high, rufously strigillose on the stem, the petioles and the nerves on the underside of the leaves, and also in the cymes, and with few or very few scattered, short hairs on the upperside of the leaves. *Stem* prostrate at the base, stout, succulent, swollen at the nodes, leafy part up to 7 in. long. *Leaves* very dissimilar,

the larger of a pair petioled, asymmetrical, obliquely obovate, elliptic or oblong, abruptly contracted into a narrow acumen, unequally cordate at the base with a small rounded lobe (to ·2 in. long) on the broader side and gradually narrowed on the inner side, entire, membranous, light-green, 4–6 in. by 1·75–3 in., 5–8-nerved from near the base, with 2–5 nerves in the broad, and 2 in the narrow half, with oblique, on both sides distinctly raised, transverse veins; petiole stout, ·5–1·5 in. long, small leaves orbicular-reniform, acute, cordate, sessile, up to ·4 in. in diam. *Cymes* terminal and axillary, long-peduncled, capitate, very dense, bracteate, few- to many-flowered; peduncles rather slender, glabrescent in the upper part, bracts numerous, linear, up to ·25 in. long; pedicels slender, ·07–·09 in. long. *Calyx* oblong, densely shaggy from short hairs, thickened below, ·07–·09 in., teeth narrow, triangular, ·04 in. long. *Petals* oblong, acuminate, white or pinkish, ·12 in. long, with a line of short, thick hairs on the back. *Anthers* short, oblong, obtuse, ·1 in. long. *Style* filiform, ·1 in. long, stigma punctiform. *Fruit* semiglobose, densely muricate, ·15 in. long and wide.

Perak; *Scortechini* 1886! Gunong Batu Pateh, in dense jungle, 3000–4000 ft. *Kunstler* 8075! 4500 ft. *Wray* 222!

27. Sonerila caesia, Stapf and King. An ascending or creeping, low herb, densely hairy on the stem, petioles and the nerves and veins on the underside of the leaves, less so in the inflorescence and with few or no hairs on the upperside of the leaves, hairs rufous, fine, straight and adpressed, particularly on the nerves, or more or less spreading on the petioles, coarse on the rhachis of the cyme and at the base of the umbels. *Stem* rather stout, prostrate below, leafy-part rarely more than ·5 in. long. *Leaves* very dissimilar, the larger of a pair long-petioled, asymmetrical, obliquely elliptic, subacuminate or subobtuse, unequally cordate at the base with a large rounded lobe (·4–·6 in. long) on the outer, and a minute or quite obscure lobe on the inner side, entire or subentire, sometimes ciliate along the margin, somewhat fleshy, blue-green above, pale, green beneath with reddish nerves and veins, 3–5 in. by 1·75–2·75 in., 6–7-nerved from near the base, 3–4 nerves in the outer (larger), 2 nerves in the inner (narrow) half, with subhorizontal or oblique transverse veins; petiole 1–3·5 in. long; small leaves minute, ovate-cordate, shortly petioled, or suppressed. *Cymes* terminal and from the upper leaf-axils, usually 2–3 in peduncled umbels with small bracts at the base, bracteate, few- to very-many-flowered, very dense; common peduncle slender, 1–2·5 in. long; special peduncles ·25–1 in. long; pedicels slender, ·08–·1 long; bracts oblong, obtuse, as long as or shorter than the pedicels, glabrous, persistent. *Calyx* obconical-campanulate, ·12 in. long, scabrid, crimson; teeth triangular, acute, distinct. *Petals* oblong, cuspidate-acuminate, ·22 in. long, pale pink. *Anthers*

short, oblong, obtuse, ·1 in. long. *Style* ·25 in. long; stigma punctiform. *Fruit* semiglobose, ·15 in. long and wide, tubercled, tubercles rounded.

Perak; Gunong Batu Pateh, 3,400 ft., *Wray* 1035! Upper Perak; 300 ft., *Wray* 3442! 3553!

28. Sonerila Nidularia, Stapf and King. An ascending, simple, rarely furcate herb, 3–8 in. high, densely rusty-tomentose on the stem, petioles and the nerves (rarely also between the nerves) on the underside of the leaves, pubescent in the inflorescence (including the calyx), otherwise glabrous; hairs fine, flexuous, short to very short and more or less adpressed or, in the upper part of the stem, sometimes longer and more or less spreading. *Stem* prostrate at the base, stout, straight or flexuous, rooting at the base, leafy part 1–5 in. long. *Leaves* very dissimilar, the larger of a pair shortly petioled, asymmetrical, obliquely oblong to obovate-oblong, subacuminate or subobtuse, unequally cordate at the base with a larger, rounded lobe (·12–·2 in. long) on the outer and a similar, but much smaller lobe on the inner side, entire, fleshy, rather firm, dark-green above, sometimes with a row of large white spots on each side of the midrib, 3–4·5 in. by 1–2 in., 5-nerved from near the base with oblique transverse veins, the outer nerve of the inner (narrow) side marginal and often indistinct; petiole stout, ·15–·6 in. long; small leaves sessile, reniform or orbicular, cordate, ·2 in. or less in diam. *Cymes* terminal and axillary, sessile, minutely or obscurely bracteate, few- to many-flowered, much contracted; pedicels very short at first, ultimately up to ·3 in. long, and stout. *Calyx* campanulate-oblong, ·12–·15 in. long; teeth triangular, acuminate, up to ·06 in. long. *Petals* obovate-elliptic, cuspidate, almost ·25 in. long. *Anthers* short, oblong, obtuse, ·14 in. long. *Style* ·25 in. long, stigma punctiform. *Fruit* shortly turbinate, subtrigonous, muricate, ·25 in. long and wide.

Perak; *Scortechini* 650! Larut, 1000–2000 ft., *Kunstler* 2345! on hills in open jungle, *King's Coll.* 5764! Gunong Haram (?), *Scortechini* 655! Waterloo, common, *Curtis!*

29. Sonerila brachyantha, Stapf and King. An ascending simple or scantily branched herb, 3–8 in. high, softly hirsute or shaggy all over, hairs dense and more or less spreading on the stem, the petioles and all parts of the inflorescence (inclusive of the calyx), looser on both sides of the blades, reddish, rather long and flexuous. *Stem* rather stout, subflexuous, leafy part 1–3 in. long, branches, if any, spreading, resembling the main stem. *Leaves* very dissimilar, the larger of a pair petioled or subsessile, more or less asymmetrical, obliquely ovate-lanceolate to oblong-lanceolate, acuminate, unequally cordate at the base with a rounded lobe (·15–·25 in. long) on the outer and a minute lobe on the inner side, entire, membranous, dark brownish-green above, reddish or

deep-red or violet beneath, 2–4 in. by 1–1·5 in., 5-nerved from near the base, with 3 side-nerves in the broad and 2 side-nerves in the narrow half, uppermost side-nerves sometimes ·4–·5 in. above the base, with indistinct oblique transverse veins; petioles usually short or very short, rarely up to ·5 in. long; small leaves ovate-cordate, acute or reniform, ·15 in. long and broad, on slender, short petioles. *Cymes* terminal and axillary, solitary or in fascicles of 2–3, subsessile, indistinctly bracteate, few- to many-flowered, very dense; peduncles very short, slender, with 2 petioled small leaflets at the base; rhachis shaggy, bracts finely filiform, ciliate, hidden among the hairs of the rhachis; pedicels very slender, about ·1 in. long. *Calyx* campanulate-oblong, ·12–·15 in. long, shaggy; teeth triangular-lanceolate, ·07 in. long. *Petals* oblong, subacute, suberect, over ·25 in. long, pinkish white or pink, with a line of hairs on the back. *Anthers* short, oblong, obtuse, ·1 in. long. *Style* over ·25 in. long; stigma punctiform. *Fruit* semiglobose-turbinate, muricate, ·2 in. long and wide.

Perak; *Scortechini* 1873! 1875! Goping, in dense jungle, *Kunstler* 434! 440! Larut, in dense jungle, 500–800 ft., *King's Collector* 5752! Malacca; Kinta Gunong, 1000–1500 ft., on rocky places, *King's Collector* 7179! Gunong Inas, 5000 ft., *Wray* 4088.

30. Sonerila microcarpa, Stapf and King. An ascending herb, 3–6 in. high, rusty-tomentose on the stem, petioles and the underside of the leaves, more coarsely hairy in the inflorescence (including the calyces) from short, somewhat stiff and spreading, or soft and more adpressed (underside of the leaves) hairs, and besides with scattered, longer and stouter, flexuous hairs on the upper side of the leaves. *Stem* long, prostrate at the base, somewhat stout, straight or subflexuous, leafy part 2–4 in. long. *Leaves* very dissimilar, the larger of a pair shortly petioled, asymmetrical, obliquely obovate-lanceolate or oblanceolate, abruptly acuminate, unequally cordate at the base with a larger rounded lobe (·1–·2 in. long) on the outer, and a similar, but very minute or obscure lobe on the inner side, subentire or entire or obtusely serrulate, fleshy, rather firm, dark-green above, sometimes with numerous small white spots, 2·5–4 in. by 1–1·5 in., 4–5-nerved from near the base with oblique transverse veins, petiole ·15–·4 in. long; the small leaves sessile, reniform or orbicular, cordate, ·2 in diam. *Cymes* terminal and from the upper axils, subsessile or shortly peduncled, ebracteate, few- to many-flowered, rather lax; peduncle very slender, if any, up to ·5 in. long; pedicels filiform, up to ·25 in. long. *Calyx* campanulate-ovoid, ·12 in. by ·08 in.; teeth triangular. *Petals* oblong, acute, almost ·25 in. long, like the calyx pink. *Anthers* short, oblong, obtuse, ·08–·1 in. long. *Style* ·25 in. long; stigma punctiform. *Fruit* pale pink, subtrigonous, turbinate, minutely muricate, ·08–·11 in. long, ·15 in. broad.

Perak; *Scortechini!* Upper Perak, 300 ft., *Wray* 3445! 3446! 3621!

31. Sonerila costulata, Stapf and King. An ascending, unbranched herb, a few inches high, densely hirsute or tomentose on the stem, the petioles and more or less also in the inflorescence, including the calyx; adpressedly strigillose on the nerves and veins on the underside of the leaves, and with scattered, often very few, stouter hairs on the upper side of the leaves, hairs rufous, those of the stem, petioles and inflorescence flexuous, more or less spreading. *Stem* prostrate below, subflexuous, leafy part rarely more than 1 in. long. *Leaves* crowded, the larger of a pair petioled, more or less asymmetrical or the upper sometimes almost symmetrical, obliquely (if asymmetrical) obovate-oblong or oblong, subacuminate, unequally cordate at the base with a rounded lobe (·2 in. long) on the larger and a minute lobe on the narrower half, entire, ciliolate along the margin, membranous, dark green, 3–6 in. by 1·3–2·5 in., 6- or rarely 7-nerved from near the base with 3 (rarely 4) nerves in the broad and 2 in the narrow half, with oblique, conspicuously prominent, transverse veins on both sides; petiole stout, ·3–·5 in. long; small leaves ovate-cordate to reniform, minute or up to ·33 in. long, on short petioles. *Cymes* terminal and in the upper axils, solitary or 2 on a common very short peduncle, ebracteate, few- or many-flowered, contracted; rhachis very slender; peduncles very short; pedicels slender, ·08–·12 in. long. *Flowers* unknown. *Fruit* semiglobose-turbinate, muricate, ·15–·18 in. long and wide.

Perak (?); foot of Gunong Panti, *Kunstler* 220!

Rather closely allied to *S. Beccariana*, Cogn.; but this has on the whole narrower, more acuminate leaves and much larger fruits.

32. Sonerila macrophylla, Stapf and King. An ascending simple herb, 3–5 in. high, softly hirsute or shaggy all over; hairs dense and more or less spreading on the stem, the petioles and all parts of the inflorescence (inclusive of the calyx), looser on both sides of the leaves, pale reddish, rather long and flexuous. *Stem* prostrate below. *Leaves* very dissimilar, the larger of a pair petioled, asymmetrical, obliquely elliptic, acuminate, unequally cordate at the base with a large, rounded lobe (·4 in. long) on the outer and a much smaller lober on the inner side, entire or subentire, membranous, on both sides light-brown when dry, 4–6 in. by 2·2–3 in., about 7-nerved from near the base, with 4 nerves in the broad, 2 in the narrow half and with usually indistinct, fine, oblique, transverse veins, uppermost side-nerve 1–1·25 in. above the base; petiole stout, ·5–1·2 in. long; small leaves ovate-cordate to reniform, up to ·25 in. long, on short, slender petioles. *Cymes* terminal and in the upper axils, solitary or 2 or a common short peduncle, ebracteate, rather many-flowered, apparently very dense owing to the long interwoven

hairs; rachis slender; common peduncle very short to ·7 in. long, slender, with a pair of spathulate-lanceolate, petioled leaflets at the point of branching; special peduncles very short; pedicels very slender, up to ·15 in. long. *Calyx* campanulate-oblong, about ·14 in. long, very shaggy; teeth triangular-lanceolate, up to ·06 in. long. *Petals* oblong, acute, suberect, ·3–·35 in. long; stigma punctiform. *Fruit* semiglobose-turbinate, muricate, about ·2 in. long and wide.

Perak; *Scortechini!*

Var. *laxipilosa*, Stapf and King. All parts loosely hairy with the hairs as in the type. *Leaves* up to 6 in. by 3·5 in., rather thinner. Common and special peduncles short or up to 3 in. long (together).

Perak; Ipoh, Kinta, *Curtis* 3154! Pulau Butong, *Curtis*!

33. Sonerila paradoxa, Naud. in Ann. Sc. Nat. Ser. 3, XV, 321. A low, creeping herb, softly hirsute or shaggy all over; hairs dense and more or less spreading on the stem, petioles and all parts of the inflorescence (including the calyx), looser on both sides of the blades, reddish, rather long and flexuous. *Stem* creeping, slender to rather stout, rooting, the leaf-bearing, terminal part rising rarely more than ·5 in. above the ground. *Leaves* crowded, very dissimilar, the larger of a pair petioled, asymmetrical, obliquely oblong or elliptic, shortly acuminate, unequally cordate at the base, with a large rounded lobe (·25–·5 in. long) on the outer and a similar but much smaller lobe on the inner side, entire or subentire, membranous, soft, light-green, 3–6 in. by 1·2–2·5 in., 6–8 nerved from near the base (3–5 nerves in the broader half), with oblique curved transverse veins; petiole ·4–2 in. long or the uppermost very short; small leaves rotundate-ovate or reniform, cordate, ·08–·4 in. in diam., on very slender petioles (·08–·6 in. long). *Cymes* terminal and from the upper axils, solitary with a pair of small petioled leaflets at the middle of the peduncle, or in umbels of 2–4, ebracteate or inconspicuously bracteate, few- to many-flowered, dense; common peduncle slender, usually 1–2 in. long; special peduncles much shorter; rhachis very shaggy; bracts linear to filiform, ciliate, short, usually hidden among the hairs of the rhachis or suppressed; pedicels ·08–·1 in. long, very slender. *Calyx* campanulate-oblong, about ·15 in. long, shaggy; teeth short, triangular. *Petals* oblong, acute, suberect, over ·25 in. long, white. *Anthers* oblong, obtuse, ·1 in. long. *Style* over ·3 in. long; stigma punctiform. *Fruit* semiglobose-turbinate, ·12–·15 in. long, ·18 in. wide, muricate-tuberculate. *S. moluccana*, Jack. Misc. I, 8; Wall. Cat. 4089; Benn. Pl. Jav. Rar. 215, (p.p.); Blume, Mus. I, 10 (p.p.); Miq. Fl. Ind. Bat. I, 562 (p.p.); C. B. Clarke in Hook. f. Fl. Brit. Ind. II, 537 (p.p.); Triana in Trans. Linn. Soc. XXVIII, 77; Cogn. in DC. Monogr. VII, 508 (p.p.); Stapf in Ann. Bot. VI, 311, 312 (p.p.); and Roxb. Flor. Ind. I, 178?

PENANG; *Wallich* Cat. 4089! *Griffith* 2298! *Maingay* 780 (Kew Distrib.) in shady, damp places, 1500–3000 ft., *Stoliczka*, *Hullet* 196! *King's Coll.* 1284! Pulloh Bahang, *Curtis* 411! SINGAPORE (?); *Lobb* 325!

Roxburgh says of his *S. moluccana*, "Habitat in insulis Moluccanis." His description is extremely short and insufficient, and there does not seem to have been a specimen in his herbarium nor was it figured by him. It is very improbable that the plant he described was identical with the Penang plant, if he received it really from the Moluccas, as the distribution of most species of the section *Hexadon* is very local, and no specimens, referrable to *S. paradoxa*, have been discovered, so far, east of the Malay Peninsula. On the other hand, it is possible that Roxburgh meant *S. malaccana* instead of "*S. moluccana*" and *insulis malaccanis* for "*ins. moluccanis*," as the editors of his Flora Indica put it. There is at least nothing in his description which would contradict the assumption that his brief diagnosis was drawn up from the Penang plant. In view of this uncertainty we have preferred to follow Naudin and to consider Roxburgh's *S. moluccana* as a "species dubia"

ERRATUM.

Last line of page 40, *for* "and" *read* "an."

ciliolate, membranous, dark-green above, pale brown (when dry) beneath, 3–4 in. by 1·7–2·3 in., 6- sub-7-nerved from near the base (with 3–4 nerves in the broader half), with usually very conspicuous subhorizontal transverse veins; petiole ·4–1·2 in. long; small leaves ovate to rotundate, acute, cordate, very small, distinctly petioled. *Cymes* terminal and axillary, peduncled, dense, at length up to ·8 in. long, deciduously bracteate; peduncle slender, up to 1·5 in. long; bracts linear-oblong, ciliolate, up to ·1 in. long, deciduous; pedicels ·07–·1 in. long. *Calyx* campanulate-oblong, teeth broad, triangular. *Petals* ovate, acute. *Anthers* short, oblong, obtuse. *Fruit* shortly turbinate, ·18–·22 in. long and wide, muricate-tuberculate, tubercles rather coarse, acute, mostly passing into short fine bristles. Korth. in Verh. Nat. Gesch. Bot. 248, t. 54; Naudin in Ann. Sc. Nat. Ser. 3, XV, 322; Triana in Trans. Linn. Soc. XXVIII, (1873), 77. *S. moluccana*, Benn. Pl. Jav., Rar. 215; Miq. Fl. Ind. Bat. I, 562; C. B. Clarke in Fl. Brit. Ind. I, 562; Cogn. in DC. Monogr. VII, 508; Stapf in Ann. Bot. VI, 312 (all references under *S. moluccana*, p.p.).

hairs; rachis slender; common peduncle very short to ·7 in. long, slender, with a pair of spathulate-lanceolate, petioled leaflets at the point of branching; special peduncles very short; pedicels very slender, up to ·15 in. long. *Calyx* campanulate-oblong, about ·14 in. long, very shaggy; teeth triangular-lanceolate, up to ·06 in. long. *Petals* oblong, acute, suberect, ·3–·35 in. long; stigma punctiform. *Fruit* semiglobose-turbinate, muricate, about ·2 in. long and wide.

Perak; *Scortechini!*

Var. *laxipilosa*, Stapf and King. All parts loosely hairy with the hairs as in the type. *Leaves* up to 6 in. by 3·5 in., rather thinner. Common and special peduncles short or up to 3 in. long (together).

Perak; Ipoh, Kinta, *Curtis* 3154! Pulau Butong, *Curtis*!

33. Sonerila paradoxa, Naud. in Ann. Sc. Nat. Ser. 3, XV, 321. A low, creeping herb, softly hirsute or shaggy all over; hairs dense and

short; small leaves rotundate-ovate or reniform, cordate, ·08–·4 in. in diam., on very slender petioles (·08–·6 in. long). *Cymes* terminal and from the upper axils, solitary with a pair of small petioled leaflets at the middle of the peduncle, or in umbels of 2–4, ebracteate or inconspicuously bracteate, few- to many-flowered, dense; common peduncle slender, usually 1–2 in. long; special peduncles much shorter; rhachis very shaggy; bracts linear to filiform, ciliate, short, usually hidden among the hairs of the rhachis or suppressed; pedicels ·08–·1 in. long, very slender. *Calyx* campanulate-oblong, about ·15 in. long, shaggy; teeth short, triangular. *Petals* oblong, acute, suberect, over ·25 in. long, white. *Anthers* oblong, obtuse, ·1 in. long. *Style* over ·3 in. long; stigma punctiform. *Fruit* semiglobose-turbinate, ·12–·15 in. long, ·18 in. wide, muricate-tuberculate. *S. moluccana*, Jack. Misc. I, 8; Wall. Cat. 4089; Benn. Pl. Jav. Rar. 215, (p.p.); Blume, Mus. I, 10 (p.p.); Miq. Fl. Ind. Bat. I, 562 (p.p.); C. B. Clarke in Hook. f. Fl. Brit. Ind. II, 537 (p.p.); Triana in Trans. Linn. Soc. XXVIII, 77; Cogn. in DC. Monogr. VII, 508 (p.p.); Stapf in Ann. Bot. VI, 311, 312 (p.p.); and Roxb. Flor. Ind. I, 178?

PENANG; *Wallich* Cat. 4089! *Griffith* 2298! *Maingay* 780 (Kew Distrib.) in shady, damp places, 1500–3000 ft., *Stoliczka*, *Hullet* 196! *King's Coll.* 1284! Pulloh Bahang, *Curtis* 411! SINGAPORE (?); *Lobb* 325!

Roxburgh says of his *S. moluccana*, "Habitat in insulis Moluccanis." His description is extremely short and insufficient, and there does not seem to have been a specimen in his herbarium nor was it figured by him. It is very improbable that the plant he described was identical with the Penang plant, if he received it really from the Moluccas, as the distribution of most species of the section *Hexadon* is very local, and no specimens, referrable to *S. paradoxa*, have been discovered, so far, east of the Malay Peninsula. On the other hand, it is possible that Roxburgh meant *S. malaccana* instead of "*S. moluccana*" and *insulis malaccanis* for "*ins. moluccanis*," as the editors of his Flora Indica put it. There is at least nothing in his description which would contradict the assumption that his brief diagnosis was drawn up from the Penang plant. In view of this uncertainty we have preferred to follow Naudin and to consider Roxburgh's *S. moluccana* as a "species dubia" and adopt Naudin's name for the Penang plant.

34. SONERILA BEGONIAEFOLIA, Blume in Flora (1831), 490. An ascending, usually unbranched herb, 2–6 in. high, moderately hairy with the exception of the often glabrous upper side of the leaves; hairs of the stem, petioles and the inflorescence rufous, flexuous, more or less spreading, of the leaves confined to the nerves and veins of the underside, often scanty, very short. *Stem* rather slender, rooting below. *Leaves* very dissimilar, the larger of each pair petioled, more or less asymmetrical, obliquely elliptic, subacuminate, unequally cordate at the base with a rounded lobe (·2–·3 in. long) on the outer and a much smaller on the inner side, entire or more or less obtusely serrulate, ciliolate, membranous, dark-green above, pale brown (when dry) beneath, 3–4 in. by 1·7–2·3 in., 6- sub-7-nerved from near the base (with 3–4 nerves in the broader half), with usually very conspicuous subhorizontal transverse veins; petiole ·4–1·2 in. long; small leaves ovate to rotundate, acute, cordate, very small, distinctly petioled. *Cymes* terminal and axillary, peduncled, dense, at length up to ·8 in. long, deciduously bracteate; peduncle slender, up to 1·5 in. long; bracts linear-oblong, ciliolate, up to ·1 in. long, deciduous; pedicels ·07–·1 in. long. *Calyx* campanulate-oblong, teeth broad, triangular. *Petals* ovate, acute. *Anthers* short, oblong, obtuse. *Fruit* shortly turbinate, ·18–·22 in. long and wide, muricate-tuberculate, tubercles rather coarse, acute, mostly passing into short fine bristles. Korth. in Verh. Nat. Gesch. Bot. 248, t. 54; Naudin in Ann. Sc. Nat. Ser. 3, XV, 322; Triana in Trans. Linn. Soc. XXVIII, (1873), 77. *S. moluccana*, Benn. Pl. Jav., Rar. 215; Miq. Fl. Ind. Bat. I, 562; C. B. Clarke in Fl. Brit. Ind. I, 562; Cogn. in DC. Monogr. VII, 508; Stapf in Ann. Bot. VI, 312 (all references under *S. moluccana*, p.p.).

SINGAPORE; Bukit Tunat, *Ridley* 2005! Chanchukang, *Ridley* 422! Bukit Mandu, *Ridley* 2005/*a*! JOHORE; Gunong Panti, *Ridley* 4199! DISTRIB. Sumatra, Java, South Borneo.

There being no flowers with the specimens enumerated, they have been described from Korthals, l.c. The Sumatra specimens have leaves which are more or less hairy or bristly on the upper side and represent Blume's VAR. *pilosiuscula* of *S. begoniaefolia* (Blume, Mus. I. 11) or *S. moluccana* VAR. *pilosiuscula* Stapf, l.c. A specimen from South Borneo, collected by Motley, is almost glabrous on the upperside of the leaves.

35. SONERILA GLABRIFLORA, Stapf and King. A creeping or ascending herb, a few inches high, with a long creeping rhizome, hairy on the stem, peduncles, petioles and the nerves on the underside of the leaves, otherwise glabrous; hairs reddish, straight, adpressed. *Stem* rather stout, slightly swollen at the nodes, frequently rooting, leafy part 1–4 in. long. *Leaves* very dissimilar, the larger of each pair petioled, asymmetric, obliquely elliptic, obtuse or subacute, unequally cordate at the base with a large, rounded lobe on the outer and small or obscure one on the inner side, entire or obscurely and remotely toothed, fleshy, soft, dark glossy-green above, pale with purple nerves beneath, 3–6 in. by 2–3·5 in., with 3–5 lateral nerves in the outer and 2–3 in the inner half near the base and with rather lax subhorizontal transverse veins; petiole rather stout, 1–2·5 in. long, the small leaves sessile, reniform-cordate, ·2–·25 in. in diam. *Cymes* terminal and axillary, usually 2- or 3-nate on a common peduncle, ebracteate, many-flowered, rather dense, glabrous, when ripe up to 1·3 in. long, common peduncle 1–2 in., special peduncles ·5–1·2 in. long, slender; pedicels very slender, ·1–·12 in. long. *Calyx* campanulate-ovoid, ·12–·15 in. by ·06 in.; teeth very broad and short. *Petals* elliptic, acute, almost ·25 in. long, white or tinged with pink. *Anthers* linear-oblong, obtuse, ·12 in. long. *Style* ·15 in. long; stigma punctiform. *Fruit* subtrigonous, hemispherical, quite smooth, ·15–·16 in. long and wide; valves in the depressed centre of the capsule 6, delicately membranous, fragile.

PERAK; Larut, in wet jungles, up to 100 ft., *Kunstler* 1955! 2128!

36. SONERILA ELATOSTEMOIDES, Stapf and King. An erect, ascending or creeping, unbranched or scantily branched herb, up to 6 in. high, softly tomentose in all parts, hairs rusty coloured, short, spreading and very dense on the stem and petioles, somewhat laxer in the inflorescence inclusive of the calyx, pale and longer on the leaves. *Stem* slender, subflexuous. *Leaves* very dissimilar, the larger of each pair petioled, asymmetrical, obliquely oblong-elliptic or obovate, acuminate, unequally cordate at the base with the outer lobe broad, rounded, up to ·2 in. long and the inner similar but much smaller, entire, membranous, green

above, whitish green below, 2·2–2·8 in. by 1–1·2 in., 6–7-nerved from near the base (with 3–4 lateral nerves in the broad and 2 in the narrow half) with oblique transverse veins, nerves and veins not very distinct; petiole ·18–·4 in. long; small leaves reniform-cordate, subsessile, ·15 in. in diam. *Cymes* terminal and axillary, long peduncled, few-flowered, not very dense, ebracteate; peduncle slender, ·6–1 in. long; pedicels slender, ·02 in. long. *Calyx* oblong-campanulate, ·08 in. long, teeth short. *Petals* oblong, acute, ·18 in. long, with a line of hairs on the back. *Anthers* short, oblong, obtuse, ·09 in. long. *Style* ·2 in. long; stigma punctiform. *Fruit* semiglobose, muricate, ·12 in. long and wide.

Perak; Gunong Bubu, *Wray* 3825!

37. Sonerila bicolor, Stapf and King. An ascending or suberect, nearly always unbranched herb, 3–9 in. high, softly hairy all over, hairs pale, straight, fine, spreading except on the upper side of the leaves, very dense in the upper part of the stem, on the petioles and in the inflorescence inclusive of the calyx. *Stem* rather slender, subflexuous, slightly swollen at the nodes. *Leaves* very dissimilar, the larger of each pair more or less asymmetrical, shortly petioled, obliquely oblong to lanceolate-oblong, distinctly acuminate, unequally cordate at the base with a rounded lobe (to ·4 in. long) on the outer, and a minute or obscure lobe on the inner side, ciliate along the margin, membranous, soft, dark green or magenta-red above with a light green band along the midrib, purple beneath, 3–6 in. by 1–1·5 in., finely 5-nerved from near the base (uppermost nerve from ·4–·6 in. above the base, with faint oblique transverse veins; petiole ·2–·6 in. long; small leaves ovate to rotundate, cordate, shortly petioled, very small to ·4 in. long. *Cymes* terminal and axillary, peduncled, loosely few- to 10-flowered, ebracteate; peduncle slender, ·4–1·2 in. long; pedicels ·1–·2 in. long, slender, also when mature. *Calyx* oblong-subcampanulate, ·12 in. long; teeth triangular, short. *Petals* elliptic-oblong, acute, ·35 in. long, pink. *Anthers* linear-oblong, subobtuse, ·12 in. long. *Style* ·35 in. long; stigma punctiform. *Fruit* semiglobose, ·12–·15 in. long and wide, muricate, opening with 6 thinly membranous teeth in the depressed centre or with 3, 2-toothed valves.

Perak; Ulu Salama, 500 ft., *Wray* 4159! Larut, in dense jungle, 500–800 ft., *King's Coll.* 5794! Tapa, *Baldwin*!

38. Sonerila Calycula, Stapf and King. An ascending or creeping herb, about 6 in. long, rusty tomentose on the stem, petioles and peduncles, and pubescent on the nerves on the underside of the leaves, otherwise glabrous; hairs short, curled or flexuous, loosely adpressed. *Stem* rather stout, straight, rooting in the lower part, leafy part about 4 in.

long. *Leaves* very dissimilar, the larger of each pair petioled, symmetrical, or almost so, lanceolate, gradually tapering towards both ends, entire, somewhat fleshy, pale-brown on both sides when dry, 3·5–5·5 in. by ·8–1·25 in., 5-nerved from the base (the outer nerves faint, submarginal) with faint oblique transverse veins; petiole ·35–·4 in. long; small leaves reniform, cordate, very minute, ·05 in. in diam., or suppressed. *Cymes* terminal and from the upper axils, peduncled, few-flowered; peduncle filiform, ·4–·5 in. long; pedicels fine, not spongy when mature, ·1–·12 in. long. *Flower* unknown. *Fruit* semiglobose, smooth, ·08–·1 in. by ·12 in., crowned by the ultimately deciduous calyx-margin the teeth of which are very broadly triangular and cuspidate.

Pahang; Tahan River, *Ridley* 2237!

9. Phyllagathis, Blume.

Herbaceous small shrubs with very short stems. *Leaves* opposite (or the terminal leaf solitary), large, petioled, orbicular, or sub-orbicular, 7–9-nerved. *Flowers* in a peduncled dense head, purple. *Calyx-tube* campanulate, glabrous or with long bristles near the top, teeth 4 (rarely 3), acute, long-setose. *Petals* 4 (rarely 3), ovate, acute, glabrous. *Stamens* 8 (rarely 6), equal; anthers elongate, scarcely produced at the base, connective without appendage. *Ovary* adnate to the bottom of the calyx-tube, 4- (rarely 3-) celled, glabrous at the apex; style filiform; ovules very numerous, placentas large axile. *Capsule* broadly funnel-shaped, opening by 4 valves at the top. *Seeds* ellipsoid, somewhat obovoid, with glandular, hardly raised dots; raphe slightly excurrent along one side of the seed its whole length.—Distrib. Species 5; all Malayan.

Leaves oblanceolate ... ... 1. *P. tuberculata.*
Leaves more or less orbicular; peduncles of inflorescence many inches long and as long as or longer than the long petioles:—
Flowers in narrow, shortly branched panicles ... 2. *P. Griffithii.*
Flowers in terminal solitary ebracteate umbels:—
Peduncles glabrous ... ... 3. *P. Scortechinii.*
Peduncles hispid ... ... 4. *P. hispida.*
Flowers in bracteate umbels with peduncles 1 or 2 inches long ... ... 5. *P. rotundifolia.*

1. Phyllagathis tuberculata, King, n. sp. *Stem* short, woody, erect, covered with small warts. *Leaves* two or three, membranous, oblanceolate, shortly acuminate, very gradually narrowed to the short hispid petiole, 7- to 9-nerved; upper surface glabrous except for a few

scattered stout bristles; lower surface coarsely strigose on the nerves, otherwise glabrous, the reticulations fine; length 10 to 16 in., breadth 3 to 6 in., petiole 0 to 1·5 in. *Peduncles* much shorter than the leaves, solitary or several from one axil, sparsely glandular-hairy, bearing at their apices a solitary, lax, involucrate, compound umbel; involucres oblong, obtuse, glabrous, ·5 in. in length or shorter, those of the umbellules smaller; pedicels shorter than the calyx-tube. *Flowers* nearly ·75 in. long. *Calyx-tube* rather widely cylindric, bearing (especially towards its base) numerous flat, shortly stalked, fleshy discoid glands; the teeth 4, short, shallow, wide, each crowned by a stalked gland. *Petals* longer than the calyx, oblong, much acuminate (forming a narrow cone in bud). *Stamens* 8; the filaments about one-fourth as long as the linear acuminate anthers. *Ovary* short, broad, truncate, deeply grooved and almost winged; style long, flattened, smooth. *Capsule* ·3 in. in diam.

Perak; *Scortechini* 1872. *King's Collector* 7233.

At once recognisable by the curiously glandular calyx.

2. Phyllagathis Griffithii, King. A shrub with a very short stem and usually only a single pair of unequal leaves. *Leaves* coriaceous, sub-rotund, 7-nerved, apex obtuse, the base cordate, edges quite entire; both surfaces glabrous, the lower lepidote and slightly puberulous on the nerves; length 5 to 8 in., breadth 3·5 to 6·5 in., petiole 4 to 8 in. *Panicle* axillary, nearly as long as the leaves, bearing in its upper half a few very short few-flowered branches, the whole lepidote especially towards the apex. *Flowers* corymbose, on scaberulous pedicels, as long as the narrowly campanulate glandular-hairy calyx-tube: mouth of calyx truncate, slightly expanded, and minutely 4-toothed. *Petals* 4, quadrate. *Stamens* much exserted: *anthers* not so long as the glabrous filaments, narrow acuminate, much sagittate at the base, inappendiculate. *Allomorphia Griffithii*, Hook. MSS. Fl. Br. Ind. II, 527. Triana in Trans. Linn. Soc. XXVIII, 74, t. VI, fig. 66c; Cogn. in DC. Mon. Phan. VII, 467.

Malacca: *Griffith* (K.D.) 2264/1. *Maingay* (K.D.) 775; *Hullett.* Perak; *Scortechini* 170; *King's Collector* 694. Selangore; *Curtis* 2333! *Ridley* 7317. Penang; *Stolickza.*

I have removed this from *Allomorphia* to *Phyllagathis* of which it has the flowers and habit.

3. Phyllagathis Scortechinii, King, n. sp. *Stem* woody below, shortly creeping above and subterete. *Leaves* on very long petioles, coriaceous, reniform-rotund, cordate, the apex minutely apiculate, stoutly 9-nerved; the transverse veins bold, glabrous on the upper surface, glandular-puberulous on the lower; length 5 to 10 in.; breadth

5 to 9 in.; petiole 4 to 9 in., stout. *Peduncles* solitary, longer and more slender than the petioles, bearing at the apex a single dense, ebracteate umbel. *Flowers* nearly ·5 in. long to the apices of the stamens, their pedicels ·25 in. long. *Calyx-tube* narrowly campanulate, not ribbed, glabrous, very minutely lepidote; the teeth 4, broad, rounded, shallow. *Petals* rotund-ovate, blunt, short. *Stamens* 8; the filaments about half as long as the linear acute anthers. *Ovary* grooved, short, broad; style as long as the anthers, cylindric, glabrous. *Capsule* about ·2 in. in diam., truncate, the valves broad, truncate.

Perak; *Scortechini* 269; *King's Collector* 4287. Selangore; *Ridley* 7317.

This species is closely allied to *P. Griffithii* but differs notably in its solitary terminal umbels.

4. Phyllagathis hispida, King, n. sp. *Stem* very short, woody, hispid. *Leaves* 2 or 3, sub-coriaceous, on long petioles, broadly ovate, cordate at the base, the apex abruptly and shortly acuminate, the edges with minute, sharp, sometimes unequal teeth, 7- to 11-nerved, the transverse nerves strong: upper surface glabrous, the lower uniformly covered with minute, scurfy pubescence, the main nerves with a few long, spreading, stout bristles; petiole densely shaggy near the base, more sparsely hispid upwards: length 5 to 10 in., breadth 3 to 7 in.; petioles varying from 4 to 12 in. *Peduncle* axillary, shorter than the leaves and more slender than the petioles, sparsely hispid; the umbel few-flowered, ebracteate. *Flowers* ·75 in. long; their pedicels slender, hispid, longer than the calyx. *Calyx-tube* narrowly cylindric or cylindric-campanulate, nearly glabrous, or sparsely hispid; the mouth with 4 broad, shallow, blunt teeth. *Petals* broadly ovate, acute. *Stamens* 8; *anthers* not much longer than the filaments, broadly lobed and cordate at the base, and the connective with a short, narrowly cylindric basal protuberance behind. *Ovary* very short; *style* filiform. *Capsule* ·2 in. across.

Perak; *Scortechini! Wray* 1021, 1602, 3519. Pahang; *Ridley* 2236.

5. Phyllagathis rotundifolia, Blume in Flora, 1831, 507. *Stem* creeping, obtusely 4-angled. *Leaves* unequal in the pairs, rotund or rotund-ovate and shortly apiculate; both surfaces, but especially the lower, minutely lepidote; main nerves 7 to 9, curved, radiating from the base, the transverse nerves bold, curved; petioles unequal, from ·85 to 3·5 in. long, their interior surfaces covered with coarse black bristles; length 2 to 8 in.; breadth 1·5 to 6 in. *Inflorescence* 4- to 30-flowered; the involucres orbicular-ovate acuminate. *Calyx-tube* ribbed, minutely lepidote; the teeth triangular, broad at the base but with

elongate narrow apices bearing 2 or 3 bristles; filaments from one-fourth to one-half of the length of the linear stamens. *Ovary* 4-angled, the apex with a truncate cartilaginous rim. Korth. in Verh. Nat. Gesch. Bot. 252, t. 57; Naud. in Ann. Sc. Nat. Ser. 3, XXV, 332; Bot. Mag. t. 5282; Miq. Fl. Ind. Bat. I, 559; Triana Melast., tab. VI, fig. 73; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 541; Cogn. in DC. Mon. Phan. VII, 518. *Melastoma rotundifolia*, Jack in Trans. Linn. Soc. XIV, 11; DC. Prodr. III, 149.

MALACCA; *Griffith*, *Maingay*. SELANGORE; *Ridley* 7327. PERAK; *Scortechini*, *King's Collector*, *Wray*. DISTRIB. Burma, Sumatra, Java; common.

Rather variable as to size of leaves and as to the number of bristles on their petioles. The teeth of the calyx also vary as to the length of the acuminate apex and as to the number of bristles.

10. MARUMIA, Blume.

Twining shrubs; branches cylindric, thickened at the nodes. *Leaves* opposite, short-petioled, coriaceous, cordate at the base, 3-nerved from the base besides two submarginal nerves, entire, stellate-tomentose beneath. *Cymes* axillary; flowers 3–5, large, pedicelled, purple or white. *Calyx-tube* narrowly campanulate, tomentose (and often bristly or stellate-hairy); lobes 4, deep, persistent. *Petals* 4, obovate. *Stamens* 8, unequal; anthers elongate, opening by a single pore; connective of the longer anthers carrying in front two long bristles and behind often one or two spurs or several twisted bristles. *Ovary* at the base (or half its height) adnate to the calyx, 4-celled, densely hairy at the apex; style filiform; ovules numerous, placentas axile. *Berry* ellipsoid, crowned by the calyx-limb. *Seeds* numerous, oblong-ellipsoid, with glandular scarcely raised dots, raphe slightly excurrent along the whole length of one side.—DISTRIB. Species 10, Malaya, Borneo and the Philippines.

Calyx-tube without bristles	1. *M. nemorosa.*
Calyx-tube very bristly :—	
Teeth of limb of calyx half as long as the tube, oblong, acute: upper surface of leaves not reticulate	2. *M. rhodocarpa.*
Teeth of limb of calyx one-fourth as long as the tube or less, broadly triangular, blunt; upper surface of leaves much reticulate	3. *M. reticulata.*

1. MARUMIA NEMOROSA, Blume in Flora XIV, (1831), 505. A straggling climber; all parts except the upper surfaces of the leaves, the petals, stamens and ovaries covered with dense rufous or pale stellate

tomentum, without bristles; the branches thickened and annulate at the nodes. *Leaves* sub-coriaceous, elliptic or oblong-lanceolate, slightly cordate at the base, the apex shortly acuminate or acute, 5-nerved (the lateral pair of nerves faint); upper surface glabrous; length 3 to 6 in.; breadth 1·35 to 2·75 in.; petiole ·2 to ·4 in. long. *Flowers* about 1·75 in. long (including the stamens), solitary or in pedunculate cymes of three from the axils of the leaves. *Calyx-tube* more or less narrowly campanulate, somewhat constricted below the limb; limb with 4 deep, triangular teeth. *Petals* broadly ovate, blunt, longer than the calyx-tube, rose-coloured. *Stamens* 8, unequal; the anthers of all linear, curved; the longer with two narrow, curved filaments at the base in front, and several smaller behind; the four smaller with two smaller, equal filaments at the base in front only. *Fruit* succulent, oblong-ovoid, constricted below the permanent calyx-teeth, sometimes sub-tuberculate and always stellate-tomentose, about 1 in. long. Blume Mus. Bot. I, 33; Naud. in Ann. Sc. Nat. Ser. 3, XV, 279; Miq. Fl. Ind. Bat. I, pt. I, 533; Triana in Trans. Linn. Soc. XXVIII, 82; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 542; Cogn. in DC. Mon. Phan. VII, 549. *M. affinis*, Korth. in Verh. Nat. Gesch. Bot. 241, t. 60; Miq. l.c. 533. *Melastoma nemorosum*, Jack in Trans. Linn. Soc. XIV, 8; DC. Prodr. III, 149; Wall. Cat. 4043.

In all the provinces except the Nicobar and Andaman Islands. Distrib. Sumatra, Borneo.

2. Marumia rhodocarpa, Cogn. in DC. Mon. Phan. VII, 550. A powerful climber; young branches, petioles, lower surfaces of leaves and calyx densely clothed with minute, pale, stellate tomentum intermixed with numerous stout, spreading, brown bristles, the nodes somewhat swollen and with transverse lines. *Leaves* sub-coriaceous, oblong, narrowed to the rounded, minutely cordate base, the apex shortly acuminate, 5-nerved (the lateral pair slender); upper surface glabrous; length 3·5 to 5 in.; breadth 1 to 2 in.; petiole ·15 to ·2 in. *Flowers* (including the stamens) nearly 1·5 in. long, in axillary, pedunculate cymes of three. *Calyx-tube* longer than the glabrous pedicel, narrowly campanulate, constricted below the limb; limb with 4 oblong, acute teeth half as long as the tube and like the latter bearing many long, curved bristles. *Petals* white, obovate. *Stamens* 8, unequal, all linear and acuminate: the four larger with two long, filiform appendages in front and several smaller behind: the four smaller with about 4 to 6 appendages. *Fruit* shortly ovoid, crowned by the large calyx-teeth, bristly, ·4 in. in diam. *Melastoma rhodocarpum*, Wall. Cat., 4045. *Marumia echinata*, Naud. Ann. Sc. Nat. Ser. 3, XV, 280; Miq. Fl. Ind. Bat. I, pt. I, 534. *M. zeylanica*, Triana

(not of Blume) in Linn. Trans. XXVIII, 82, tab. VII, fig. 88*b*; C. B. Clarke in Fl. Br. Ind. II, 542.

SINGAPORE; *Wallich; Anderson* 68, 69; *Hullett* 125; *Ridley* 258; *King's Collector* 278. MALACCA; *Maingay* (K.D.) 785; *Cuming; Griffith* (K.D.) 2270.

VAR. *sub-glabrata*, Cogn. l.c. 550. Leaves glabrous beneath except the nerves. *M. zeylanica*, C. B. Clarke (not of Blume), VAR. *sub-glabrata*, Hook. fil. Fl. Br. Ind. II, 542.

SINGAPORE; *Anderson* 64.

3. MARUMIA RETICULATA, Blume Mus. Bot. I, 34. Scandent; young branches, petioles, under surfaces of leaves and calyx densely clothed with rusty stellate, more or less deciduous hairs, the young branches, petioles and especially the calyx with stout spreading bristles intermixed; the nodes swollen and annulate. *Leaves* subcoriaceous, ovate-lanceolate, 5-nerved (the lateral pair slender), minutely cordate at the base, the apex shortly acuminate; upper surface deeply reticulate, glabrous; length 2 to 3·5 in., breadth ·8 to 1·5 in., petiole ·1 to ·2 in. *Flowers* 1·25 in. long (including the anthers), axillary, either solitary on pedicels as long as themselves or in pedunculate cymes of three; the middle flower being nearly sessile, the lateral pair on short pedicels. *Calyx-tube* densely hispid externally, the teeth 4, short, broadly triangular and blunt, tomentose on the inner surface. *Petals* ovate, sub-acute, glabrous. *Stamens* 8, the anthers somewhat unequal in length but all linear, curved and with two long appendages at the base in front. *Fruit* ovoid, (unripe) ·5 in. in diam., crowned by the calyx-teeth. Miq. Fl. Ind. Bat. I, pt. I, p. 535; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 542; Cogn. in DC. Mon. Phan. VII, 551. *M. stellulata*, Korth. (not of Blume) Ver. Nat. Gesch. Bot. 243. *M. oligantha*, Naud. in Ann. Sc. Nat. Ser. 3, XV, 281; Miq. l.c. 534.

MALACCA; *Griffith* (K.D.) 2269; *Maingay* 784. DISTRIB. Sumatra, Java.

11. DISSOCHÆTA, Blume.

Shrubs, usually twiners. *Leaves* opposite, petioled or nearly sessile, elliptic or oblong-lanceolate, rounded at the base, 5-nerved from the base (the two submarginal nerves slender), entire. *Flowers* in terminal, sometimes leafy panicles, purple or white, bracts large or small. *Calyx-tube* campanulate-cylindric or funnel-shaped, densely stellate-tomentose, pubescent or glabrous; limb obscurely 4-lobed or entirely truncate, more rarely distinctly 4-toothed, persistent. *Petals* 4. *Stamens* 8, unequal, 4 shorter sometimes wanting, connective of the 4 longer with 2 long bristles in front at the base. *Ovary* adnate to the

calyx, 4-celled, apex glabrous or densely hairy; style filiform; ovules very many, placentas axile. *Berry* ovoid or elliptic, crowned by the calyx-limb. *Seeds* elipsoid, flattened on the side of the raphe.—DISTRIB. Species 25; throughout Malaya to the Philippines.

Stamens 8 (four of them sometimes imperfect) :—
- Young branches, under surfaces of leaves and panicles covered with persistent stellate-tomentum :—
  - The stellate-tomentum not mixed with bristles; the nodes with transverse interpetioler lines :—
    - Flowers 1·75 in. long ... ... 1. *D. annulata.*
    - Flowers ·75 in. long ... ... 2. *D. punctulata.*
  - The stellate-tomentum mixed with spreading persistent bristles; flowers ·75 in. long ... 3. *D. hirsuta.*
- Young branches, under surfaces of leaves and panicles covered at first with stellate-tomentum which ultimately more or less disappears :—
  - Bracts of panicle obovate, persistent ... ... 4. *D. bracteata.*
  - Bracts of panicle linear, deciduous ... ... 5. *D. pallida.*
- Young branches, under surfaces of leaves and panicles covered with minute simple scales not stellate ... 6. *D. gracilis.*

Stamens 4 :—
- Panicles ebracteate, or bracts, if any, caducous :—
  - Flowers ·3 in. long; fruit ·15 to ·2 in. in diam.; mouth of calyx-tube 4-toothed; petals broadly oblong, blunt; stamens blunt, not appendiculate at the apex ... ... 7. *D. celebica.*
  - Flowers ·5 in. long; fruit ·2 to ·25 in. in diam.; mouth of calyx-tube truncate not toothed: petals ovate, acute; stamens narrowed to the appendiculate apex ... ... 8. *D. intermedia.*
- Panicles with persistent, oblong bracts :—
  - Young branches at first rusty stellate-hairy, finally glabrous; branches of panicle divaricating, lax ... ... 9. *D. anomala.*
  - Young branches with persistent, pale, adpressed, stellate hairs; branches of panicle short, condensed ... ... 10. *D. Scortechinii.*

1. DISSOCHÆTA ANNULATA, Hook. fil. ex Triana in Trans. Linn. Soc. XXVIII, 83. A strong climber; young branches, petioles, under surfaces of leaves and inflorescence covered with dense, rusty, deciduous stellate tomentum, the nodes thickened and slightly annulate. *Leaves* coriaceous, ovate-oblong, cordate at the base, the apices shortly and rather abruptly acuminate, upper surface at first sparsely stellate-hairy, ultimately glabrous, the nerves and reticulations bold; length 2·5 to 3·5 in.; breadth 1 to 1·8 in.; petiole ·2 to ·5 in. *Panicle* solitary terminal, much longer than the leaves, lax, the branches divaricating,

cymose, 1- to 3-flowered; bracts small, caducous. *Flowers* 1·5 in. long (including the stamens), pedicels much shorter than themselves. *Calyx-tube* narrowly campanulate or funnel-shaped, the mouth widened and with 4 blunt, triangular teeth, densely stellate-hairy outside. *Petals* obovate-oblong, blunt, reflexed. *Stamens* 8; curved, elongate-linear, acuminate, with two bristle-like appendages at the base in front, laciniate behind. *Fruit* ellipsoid, succulent, crowned by the enlarged teeth of the calyx-tube. C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 543; Cogn. in DC. Mon. Phan. VII, 557. *Melastoma bracteatum*, Wall. Cat. 4044 (in part).

Penang; *Wallich* 4044; *Griffith* (K.D.) 2268; *Maingay* (K.D.) 788; *Curtis* 740. Malacca; *Wallich*. Singapore; *Hullet* 213; *Ridley* 5187. Johore; *King's Collector* 224. Perak; *Scortechini* 235. Distrib. Borneo.

2. Dissochæta punctulata, Hook. fil. ex Triana in Linn. Trans. XXVIII, 83. Young branches thickened but not annulate, clothed like the petioles, under surfaces of the leaves and the inflorescence with minute, rusty scales. *Leaves* coriaceous, oblong-ovate, the base rounded and not cordate, the apex acute or very shortly acuminate; 5-nerved, the marginal nerves very slender; upper surface glabrous; length 3 to 4·5 in.; breadth ·75 to 1·75 in.; petiole ·25 to ·4 in. *Panicles* solitary, terminal, several times longer than the leaves, the branches and branchlets short and the latter cymosely few-flowered, bracts small, linear, deciduous. *Flowers* ·75 in. long (including the stamens), on pedicels shorter than themselves. *Calyx-tube* infundibuliform, the mouth with a broad, everted, wavy, obscurely toothed edge, deciduously scaly. *Petals* 4, ovate, sub-acute, glabrous. *Anthers* 8, equal, curved, cylindric, attenuated to the 1-pored apex, the base with two long, geniculate, upward-curving, narrow, flattish appendages. *Fruit* succulent, urceolate, slightly warted, sub-glabrous, crowned by the slightly enlarged mouth of the calyx, ·4 in. long. C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 543; Cogn. in DC. Mon. Phan. VII, 555.

Malacca; *Griffith* (K.D.) 2291! *Maingay* 789. Singapore; *Ridley* 3918, 4803. Selangore; *Ridley* 2015. Johore; *Ridley* 3246, 2106. Penang; *Walker, etc.*

3. Dissochæta hirsuta, Hook. fil. ex Triana Trans. Linn. Soc. XXVIII, 83. A strong creeper with slender branches only slightly thickened at the nodes; all parts except the upper surfaces of the leaves and the petals densely clothed with deciduous, stellate hairs mixed with long, stiff, spreading, curved hairs. *Leaves* membranous, lanceolate or ovate-lanceolate, 5-nerved (the lateral pair slender), the base rounded and slightly cordate, the apex shortly acuminate; upper surface

glabrous, length 3 to 4·5 in.; breadth 1 to 1·75 in.; petiole ·15 to ·3 in. *Panicle* solitary, terminal, thickened at the nodes, broadly pyramidal, much branched. *Flowers* ·75 in. long. *Calyx-tube* longer than the pedicel, cylindric-tubular, the mouth not everted but with four linear elongate teeth. *Petals* 4, broadly lanceolate, blunt. *Stamens* 8, equal, all perfect, elongate and narrow, the apices much prolonged into a rather thin appendage, the base with two delicate, filiform appendages. *Fruit* ovoid-globose, crowned by the persistent calyx-limb, densely setose-lepidote, ·4 in. in diam. Cogn. in DC. Mon. Phan. VII, 556.

Johore; at the base of Gunong Panti; *King's Collector* 197; *Ridley* 4185. Distrib. Borneo.

4. Dissochæta bracteata, Blume in Flora, 1831, 495. Young branches with a transverse ridge at the nodes, petioles and panicles more or less densely clothed with sub-deciduous, rusty, stellate hairs, and the under surfaces of the leaves sparsely so. *Leaves* membranous, 5-nerved (the marginal pair faint), ovate-lanceolate, the base rounded and often sub-cordate, the apex acute or shortly acuminate; upper surface glabrous, the lower sparsely stellate-hairy; length 3 to 4·5 in.; breadth 1·25 in.; petiole ·2 to ·3 in. *Panicles* much bracteate, both axillary and terminal, the former shorter, the latter longer, than the leaves; the branches few, divaricate. *Flowers* 1·2 in. long (including the stamens), in cymes at the ends of the branchlets, each subtended by, and while in bud enveloped in, a membranous, obovate, blunt, stellate-pubescent, more or less permanent bract about ·5 in. long. *Calyx-tube* twice as long as the pedicels, cylindric-campanulate, the mouth slightly widened and minutely 4-toothed. *Petals* broadly elliptic, blunt, glabrous. *Stamens* 8, much curved, long, linear, the base with two long flattened, linear, upward-pointing appendages. *Fruit* ellipsoid, crowned by the rim of the calyx-tube, ·6 in. long. Miq. Fl. Ind. Bat. I, pt. I, 529; Triana in Trans. Linn. Soc. XXVIII, 84; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 543; Cogn. in DC. Mon. Phan. VII, 598. *D. bracteosa*, Naud. in. Ann. Sc. Nat. Ser. 3, XV, 76; Miq. Fl. Ind. Bat. I, pt. I, 527. *Melastoma bracteatum*, Jack in Trans. Linn. Soc. XIV, 9; Wall. Cat. 4044, partly.

Penang; *Wallich*, Cat. 4044; *Curtis* 2298. Malacca; *Maingay* 791. Distrib. Borneo, *Haviland*.

5. Dissochæta pallida, Blume in Flora, 1831, 500. A shrubby creeper, 20 to 50 feet long; young branches thickened and with inter-petiolar ridges at the nodes, sparsely covered with minute stellate-hairy scales like the petioles, under surfaces of the leaves and the panicles. *Leaves* sub-coriaceous, 5-nerved (the lateral pair faint), elliptic-ovate to ovate, the base rounded and sub-cordate, the apex shortly acuminate

or acute; upper surface glabrous; length 2·5 to 5 in.; breadth 1·2 to 2·2 in.; petiole ·3 to ·5 in. *Panicles* both axillary and terminal, the former shorter than the leaves or slightly exceeding them, the latter longer, all rather lax, the branchlets divaricating, cymose, and with a few short, linear, deciduous bractlets. *Flowers* nearly 1 in. long (including the stamens). *Calyx-tube* oblong-campanulate or funnel-shaped, densely lepidote-stellate; the mouth expanded and obscurely 4-toothed. *Petals* obovate-oblong, blunt, glabrous. *Stamens* 8, usually equal (four sometimes shorter or obsolete); basal processes long, linear, sub-erect. *Fruit* cylindric-campanulate, sub-glabrous, crowned by the slightly enlarged limb of the calyx, ·25 in. long. Blume, Mus. Bot. I, 36 (excl. syn. Korth.); Naudin in Ann. Sc. Nat. Ser. 3, XV, 69, tab. 4 fig.; Miq. Fl. Ind. Bat. I, pt. I, 528; Triana in Trans. Linn. Soc. XXVIII, 83, tab. VII, fig. 89*b*; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 544; Cogn. in DC. Mon. Phan. VII, 557. *Melastoma pallida*, Jack in Trans. Linn. Soc. XIV, 12; DC. Prodr. III, 150; Wall. Cat. 4049. *Dissochæta ovalifolia* and *D. superba*, Naud. l.c. 76 and 77. *D. astrotricha*, Miq. l.c. Suppl. 318.

In all the provinces except the Nicobar and Andaman Islands; common.

The four stamens which are usually shorter than the other are sometimes obsolete.

6. Dissochæta gracilis, Blume in Flora, 1831, 498. A straggling or scandent shrub; young branches slender, bluntly 4-angled, the nodes swollen and transversely ridged, minutely scaly like the petioles, leaves and panicles. *Leaves* 5-nerved (the lateral pair slender), broadly lanceolate or oblong-lanceolate, rounded at the base and shortly acuminate at the apex; length 3 to 4·5 in.; breadth 1·5 to 1·8 in.; petiole ·2 to ·4 in. *Panicles* axillary and terminal, the former shorter than, and the latter longer than the leaves, slender, spreading, lax, many-flowered; bracts few, narrowly oblong, caducous. *Flowers* ·35 in. long, on filiform pedicels longer than themselves. *Calyx-tube* narrowly campanulate, minutely stellate-pubescent, the mouth glabrous, sub-truncate, everted, and obscurely 4-toothed. *Petals* 4, broadly ovate or sub-orbicular, blunt. *Stamens* 8; four large, perfect, rather short, with a broad truncate 2-pored apex; the four imperfect small, narrow all with two erect, filiform flat basal appendages. *Fruit* sub-globular, crowned by the narrow limb, almost glabrous, ·1 to ·15 in. in diam. Korthals Verh. Nat. Gesch. Bot. 237; Naud. in Ann. Sc. Nat. Ser. 3, XV, 75; Miq. Fl. Ind. Bat. I, pt. I, 526; Triana in Trans. Linn. Soc. XXVIII, 83, tab. VII, fig. 89*c*; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 544; Cogn. in DC. Mon. Phan. VII, 559. *Melastoma gracile*, Jack

in Trans. Linn. Soc. XIV, 14; DC. Prodr. III, 149. *M. fallax*, Wall. Cat. 4080. ? *M. glauca*, Griff. Ic. Pl. As. 637. *M. vacillans*, var. *pallens*, Blume, Bijdr. 1074.

In all the provinces except the Nicobar and Andaman Islands. DISTRIB. Java, Borneo.

7. DISSOCHÆTA CELEBICA, Blume, Mus. Bot. I, 36. A slender creeper; young branches, petioles and under surfaces of the leaves, also the panicles, densely clothed with rusty, scurfy, stellate tomentum. *Leaves* 3-nerved, membranous, lanceolate or oblong-lanceolate, the base rounded, the apex shortly acuminate; upper surface glabrous except the stellate-pubescent midrib; length 2·5 to 5 in.; breadth 1 to 2 in.; petiole ·2 to ·25 in. *Panicles* lateral and terminal, the former slightly longer and the lateral several times longer than the leaves, ebracteate, the branches divaricating, the ultimate branches cymose, 3-flowered. *Flowers* ·3 in. long (including the stamens). *Calyx-tube* oblong-campanulate, slightly widened and 4-toothed at the mouth, somewhat longer than the pedicel. *Petals* 4, broadly oblong, blunt. *Stamens* 4; anthers equal, short, blunt and with no apical appendage, opening by 2 apical pores. *Fruit* sub-globular, crowned by the narrow limb of the calyx, faintly 8-ribbed, sparsely pubescent or sub-glabrous, ·15 to ·2 in. in diam. C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 544; Cogn. in DC. Mon. Phan. VII, 561; Miq. Fl. Ind. Bat. I, pt. I, 530; Triana in Trans. Linn. Soc. XXVIII, 83. *D. microcarpa*, Naud. in Ann. Sc. Nat. Ser. 3, XV, 72; Miq. l.c. 523. *D. bancana*, Miq. l.c. 529. *Melastoma fallax*, Wall. Cat. 4050; ? Jack in Trans. Linn. Soc. XIV, 13. *M. rubiginosum*, Wall. Cat. 4052, partly.

In all the provinces except the Nicobar and Andaman Islands; common. DISTRIB. Bangka, Celebes, Borneo.

VAR. *contracta*, King. *Panicle* solitary, terminal, short, condensed, not longer than the leaves.

PERAK; *King's Collector* 2911.

8. DISSOCHÆTA INTERMEDIA, Blume in Flora, 1831, 493. A somewhat slender creeper, resembling *D. celebica* in its other parts, but with larger flowers (·5 in. long), pointed in bud; larger fruit (·2 to ·25 in. in diam.); calyx-tube with a truncate, toothless mouth; ovate, acute petals, and longer stamens narrowed to and appendiculate at the apex. Blume, Mus. Bot. I, 35, tab. V; Naud. in Ann. Sc. Nat. Ser. 3, XV, 72; Miq. Fl. Ind. Bat. I, pt. I, 524; Triana in Trans. Linn. Soc. XXVIII, 83, tab. VII, fig. 89 f.; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 544; Cogn. in DC. Mon. Phan. VII, 562. *Melastoma rubiginosum*, Wall. Cat. 4052 (in part).

MALACCA; *Griffith* (K.D.) 2287; *Helfer* (K.D.) 2286. PENANG and SINGAPORE; *Wallich*. PERAK; *Scortechini*. DISTRIB. Java, Borneo.

9. Dissochæta anomala, King, n. sp. A creeper 15 to 20 feet long; young branches slender, slightly thickened at the nodes, at first sparsely rusty stellate-hairy, afterwards glabrous and sub-glaucous. *Leaves* ovate-oblong, the base broadly rounded, the apex shortly, abruptly and bluntly acuminate, 5-nerved (the two lateral nerves faint); upper surface glabrous; the lower sparsely stellate-hairy on the midrib and nerves, otherwise glabrous; length 3·5 to 6·5 in.; breadth 1·75 to 2·75 in.; petiole sparsely hispid, ·2 in. long. *Panicles* axillary and terminal, the former half as long and the latter twice as long as the leaves, stellate-pubescent especially at the thickened nodes; the branches divaricate, trichotomous, lax, bracteate at the divisions; the bracts ·3 in. long, oblong, blunt, involute, stellate-tomentose, their edges ciliate. *Flowers* ·3 in. long, in cymes of three. *Calyx-tube* shorter than the pedicel, narrowly campanulate, densely stellate-tomentose; the mouth without teeth, truncate, not everted. *Petals* glabrous, ovate, acuminate, forming a pointed bud. *Stamens* 4, equal and all perfect, subsessile, broad, blunt, the lateral basal appendages filamentous. *Fruit* broadly campanulate, crowned by the narrow calyx-limb, glabrous, ·15 in. in diam.

Perak; *King's Collector* 2258, 10468.

This plant forms a collecting link between the genera *Anplectrum* and *Dissochæta* as they are defined in this work. It agrees in externals with *Anplectrum pallens*, and has the 4 stamens of that genus, but their anthers have the elongate basal processes so well developed in *Dissochæta* and not at all represented in *Anplectrum*.

10. Dissochæta Scortechinii, King, n. sp. Scandent; young branches slender, the nodes swollen and transversely ridged, thinly clothed with minute, pale, stellate hairs. *Leaves* ovate-lanceolate, slightly cordate at the broad base, the apex with a short, blunt point; 5-nerved (the lateral pair small); upper surface glabrous; lower rusty in colour and bearing sparse, white, stellate hairs longer than those on the stem; length 2·5 to 3·75 in.; breadth 1·5 to 2 in.; petiole densely rusty stellate-tomentose, ·1 in. long. *Panicle* solitary, narrow, terminal, shorter than the leaves, densely rusty stellate-tomentose, the branches short and few-flowered, bearing many oblong, blunt or spathulate, pale, 3-nerved almost glabrous bracts longer than the flower-bud, the lower ones much larger. *Flowers* ·3 in. long, their pedicels short. *Calyx-tube* narrowly campanulate, at first densely but afterwards sparsely stellate-tomentose; the mouth truncate, without teeth, waved but not everted, glabrous. *Petals* 4, glabrous, orbicular-ovate, acuminate, forming a pointed bud. *Stamens* 4, all equal and perfect, short, broadly ovate, the base with two long, erect, filiform appendages, the broad apex with a small, pale,

subacute appendage. *Fruit* unknown. *D. intermedia*, Scort. MSS. (not of Blume), in Herb. prop.

Perak; *Scortechini* 23, 34. Penang; *Curtis* 1301.

12. Anplectrum, A. Gray.

Twining shrubs. *Leaves* subcoriaceous, or rarely coriaceous, opposite, short-petioled, entire, oblong, narrowed upwards, 3–5-nerved from the base. *Flowers* white, in terminal panicles sometimes leafy at the base. *Calyx-tube* funnel-shaped or ovoid, limb obscurely 4-lobed or truncate. *Petals* 4. *Stamens* 4 perfect, rarely 8, anthers attenuated upwards, opening by one pore, connective at base shortly appendaged or subnude, never with two long bristles in front, rarely with a long appendage and two small erect bristles; imperfect stamens 4, 2, or 0. *Ovary* 4-celled, free at the apex, with 4 vertical ridges; style simple; ovules many, placentas axile. *Berry* ovoid or globose, crowned with the calyx-limb. *Seeds* very many, small, falcate, obovoid; raphe long, lateral. Distrib. Species about 18, in Malaya and the Philippines.

Stamens 4 perfect:—

- Nodes of the young branches and of the lower part of the panicle with conspicuous, stellately lepidote, bristly annuli ... ... 1. *A. lepidoto-setosum.*
- Nodes of the young branches and of the panicle with a small smooth annulus or faint transverse ridge:—
  - Calyx-tube funnel-shaped; stamens 4, all perfect; young branches stellate-hairy ... 2. *A. glaucum.*
  - Calyx-tube ovoid to globular-ovoid; stamens 8, the anthers of 4 of them narrow and imperfect; young branches glabrous or nearly so ... ... 3. *A. pallens.*
- Nodes not annulate; stamens 8, the anthers of 4 of them narrow and imperfect; young branches and panicles densely stellate-scaly ... ... 4. *A. divaricatum.*

Stamens 8 perfect ... ... 5. *A. anomalum.*

1. Anplectrum lepidoto-setosum, King, n. sp. Young branches slender, conspicuously annulate at the nodes, sparsely clothed with coarse, spreading hairs with thickened points, the very youngest also with deciduous, stellate hairs. *Leaves* oblong-lanceolate, 5-nerved; the base rounded and minutely cordate, the apex shortly caudate-acuminate; both surfaces glabrous except for a few coarse hairs near the petiole; the lower shining and pale when dry; length 4·5 to 6 in.; breadth 1·1 to 1·8 in.; petiole very short, attached to the cup-shaped, densely rufous stellate-tomentose node and like it with scattered

bristle-hairs. *Panicle* terminal, solitary, shorter than the leaves, everywhere densely rusty-tomentose with long bristles intermixed, annulate at the bases of the short, spreading, few-flowered branches. *Calyx-tube* cylindric; the mouth undulate-truncate, obscurely toothed, its outer surface stellate-lepidote with a few long bristles near the mouth. *Petals* 4, ovate, glabrous. *Stamens* 8 (4 large and 4 small); the large broad, and with a short, grooved ridge on the back near the base, blunt; the 4 small linear, very acuminate. *Capsule* ovoid-globular, truncate, nearly glabrous, ·15 in. in diam.

Perak; *Scortechini* 2106.

2. Anplectrum glaucum, Triana in Trans. Linn. Soc. XXVIII, 84 (*excluding much of the synonymy*). Scandent, to 20 or 30 feet; young branches 4-grooved, stellate-hairy like the petioles and main nerves of the leaves and the inflorescence, the nodes inconspicuously annulate or transversely ridged. *Leaves* oblong-lanceolate, rounded or slightly narrowed to the often slightly cordate base, the apex shortly acuminate or acute, boldly 3-nerved; both surfaces glabrous except for some scattered, stellate hairs; length 3 to 5 in.; breadth 1 to 2 in.; petiole ·5 to ·25 in. *Panicle* large, terminal, solitary, several times larger than the leaves, pyramidal, its branches divaricate, many-flowered. *Flowers* drooping, ·4 or ·5 in. long (including the stamens). *Calyx-tube* funnel-shaped, sub-glabrous; the mouth truncate, not toothed, everted with age. *Petals* ovate-lanceolate with truncate bases, the apex acuminate. *Stamens* 4; *anthers* much curved, all perfect, their bases not lobed but with a corrugated membranous process in front. *Ovary* prominently 4-winged. *Fruit* truncate, sub-globular, glabrous, ·2 in. long (when dry). C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 545; Cogn. in DC. Mon. Phan. VII, 566. *A. cyanocarpum*, Kurz in Journ., As. Soc., 1877, pt. 2, p. 78 (not of Triana). *Melastoma glauca*, Jack in Trans. Linn. Soc. XIV, 15; DC. Prodr., 151. *M. cernuum*, Wall. Cat. 4055 (not of Roxb.). *Osbeckia tetrandra*, Roxb. Fl. Ind. II, 224. *Dissochæta glauca*, Blume in Flora, 1831, p. 501. *D. spoliata*, Naud. in Ann. Sc. Nat. Ser. 3, XV, 69, t. 4, fig. 1.

In all the provinces, common. Distrib. Sumatra, Java, Borneo.

3. Anplectrum pallens, Blume, Mus. Bot. I, 38. Scandent, to 30 or 40 feet; young branches terete, glabrous or minutely puberulous, especially near the slightly thickened and transversely ridged nodes, round. *Leaves* oblong, the base rounded, the apex abruptly, bluntly and shortly sub-caudate acuminate, 5-nerved (the marginal pair slender), the edges (when dry) slightly recurved; upper surface glabrous, the lower minutely and scantily stellate-puberulous; length 1·5 to 4·5 in., breadth ·5 to 1·5 in.; petiole ·1 to ·2 in. *Panicles* axillary (about as

long as the leaves) and terminal (much longer than the leaves), slender, spreading, lax, rather few-flowered, with a small, blunt, oblong, deciduous bract under each branch, finely rufous stellate-pubescent. *Flowers* about ·4 in. long (including the stamens). *Calyx-tube* ovoid to globular-ovoid, densely rufous-puberulous when young, glabrous when old, the mouth slightly expanded and with very small teeth. *Petals* ovate, acute, glabrous. *Anthers*; the four large much curved and sub-acute; the rudimentary linear, acuminate. *Capsule* globose-obovoid, glabrous, ·15 in. in diam. Naud. in Ann. Sc. Nat. Ser. 3, XV, 303; Triana in Trans. Linn. Soc. XXVIII, 303; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 545; Cogn. in DC. Mon. Phan. VII, 564. *Melastoma petiolare*, Wall. Cat. 4053.

In all the provinces except the Andaman and Nicobar Islands; not uncommon. Distrib. Sumatra, Borneo.

4. Anplectrum divaricatum, Triana in Trans. Linn. Soc. XXVIII, 84 (in part), tab. VII, fig. 90*b*. Scandent, to 20 or 30 feet; young branches obscurely quadrangular, and like the petioles, nerves of the leaves on both surfaces, and the inflorescence, densely covered with tawny, stellate scales, not annulate at the nodes. *Leaves* lanceolate, acute or sub-acute, the base minutely cordate, 5-nerved, the marginal pair slender; both surfaces, but especially the lower, with glandular-punctate scales between the nerves and veins; length 2 to 3 in.; breadth ·6 to 1·1 in.; petiole ·15 to ·25 in. *Panicle* solitary, terminal, pyramidal, several times as long as the leaves, the branchlets divaricate, each with two ovate-lanceolate, ciliate, furfuraceous, deciduous bracts at its base and three flowers in a cyme at the apex. *Flowers* ·4 in. long, on short pedicels. *Petals* oblong, acute. *Calyx-tube* narrowly obovoid, campanulate, truncate, densely furfuraceous stellate-tomentose. *Anthers* 8; the 4 large thick and much curved, obtuse; the smaller narrow. *Capsule* globose-obovoid, with a narrow, everted rim, length ·15 to ·2 in. C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 546; Cogn. in DC. Mon. Phan. VII, 567. *Melastoma divaricatum*, Willd. Spec. Pl. II, 596; DC. Prodr. III, 150. *M. polyanthum*, Benth. in Wall. Cat. 4051. *Dissochæta divaricata* and *D. pepericarpa*, Naud. Ann. Sc. Nat. Ser. 3, XV, 70 and 71. *D. anceps*, Naud. l.c. 70. *D. palembanica*, Miq. Fl. Ind. Bat. Suppl. 317.

Malacca; *Griffith* (K.D.) 2288/1: *Maingay* (K.D.) 794: *Harvey*. Penang; *Wallich* 4051. Perak; *King's Collector* 369. Distrib. Java, Borneo, Sumatra.

5. Anplectrum anomalum, King and Stapf, n. sp. A woody creeper, 20 to 100 feet long; young branches as thick as a wheat-straw, terete, covered with stellate, rusty scurf. *Leaves* coriaceous, o bo vate

oblong, blunt, much narrowed to the base, 3-nerved, glabrous on the upper, rusty stellate-hairy on the lower surface like the petioles and inflorescences; length 1 to 1·5 in.; breadth ·6 to ·9 in.; petiole ·2 in. *Panicles* terminal, sometimes leafy, 3 to 6 in. long, lax, the branches in pairs, divaricate, many-flowered, minutely bracteolate at the divisions. *Flowers* ·35 in. long, the pedicels somewhat longer. *Petals* oblong, obtuse, waxy, reflexed, pale greenish-white. *Stamens* 8, equal; anthers inflexed in aestivation, lanceolate-subulate, the base of the lobes produced into an elongated halbert-shaped process with two erect subulate processes at its broad upper end. *Fruit* (not quite ripe) ovoid-globose, greenish-yellow, ·2 in. in diam.

Perak; *King's Collector* 5779, 10357.

This plant differs from *Anplectrum*, as the genus has hitherto been limited, in having 8 anthers, each of which has a very much produced halbert-shaped basal process, from which two erect hair-like appendages originate at the upper or broad end. The plant agrees better with *Anplectrum* than with any other *Melastomaceous* genus, but it might possibly be better treated as the basis of a new one.

13. Medinilla, Gaud.

Branching shrubs, erect or scandent. *Leaves* opposite or whorled, rarely alternate, entire, often fleshy, mostly glabrous, usually longitudinally 3–9-nerved. *Flowers* in terminal panicles or lateral cymes, white or rose, with or without bracts, 4- or 5-, rarely 6-merous. *Calyx-tube* ovoid or cylindric, limb truncate or obscurely toothed. *Stamens* twice as many as the petals, equal or nearly equal (rarely unequal); anthers opening at the top by one pore; connective not (or very shortly) produced at the base but having two tubercles in front and a spur behind. *Ovary* inferior, 4–6-celled, usually glabrous at the apex; style filiform; ovules very many, placentas axile. *Berry* crowned by the limb of the calyx. *Seeds* very many, ovoid or subfalcate, raphe often thickened and excurrent.—Distrib. Species about 100; mainly in Malaya, East Bengal and Ceylon; a few in the Fiji Archipelago and in the East African islands.

Flowers 4-merous:—
- Leaves alternate ... ... 1. *M. scandens.*
- Leaves in whorls (large) ... ... 2. *M. speciosa.*
- Leaves opposite:—
  - Flowers in terminal panicles, anthers dissimilar ... 3. *M. heteranthera.*
  - Flowers in lateral panicles, anthers similar:—
    - Anther-cells with tubercles at their bases in front, and a short spur from the connective behind:—
      - Flowers 1 in. long ... ... 4. *M. venusta.*

Flowers under ·5 in. long :—
Leaves petiolate ... ... 5. *M. Hasseltii.*
Leaves sessile ... ... 6. *M. Scortechinii.*
Anther-cells with tubercles at the base in front, but no spur from the connective behind ... 7. *M. Maingayi.*
Flowers 5-merous :—
Leaves in whorls :—
Leaves elliptic or obovate, blunt, 1 to 2·75 in. long, fruit ·15 in. in diam. ... ... 8. *M. Clarkei.*
Leaves oblanceolate or narrowly obovate, acuminate, 3 to 5 in. long ; fruit ·4 in. in diam. ... ... 9. *M. crassinervia.*
Leaves elliptic-rotund, blunt, 2·5 to 5·5 in. long; fruit ·35 in. in diam. ... ... 10. *M. perakensis.*

1. Medinilla scandens, King, n. sp. A climber, 15 to 30 feet long, rooting and adhering to trees ; the stems rough, as thick as a swan's quill. *Leaves* alternate, glabrous, long-petioled, subcoriaceous, elliptic or ovate-oblong, shortly acuminate, the base cuneate ; nerves 5 to 7, mostly from the midrib above its base ; length 4·5 to 9 in. ; breadth 2·5 to 6 in. ; petioles 1·5 to 7 in. *Flowers* ·4 in. long, in dense fascicles in the axils of fallen leaves, on rusty-puberulous, minutely bracteolate pedicels. *Calyx-tube* narrowly campanulate ; the limb very slightly expanded, truncate, very obscurely toothed. *Petals* 4, ovate-oblong, acute. *Stamens* 8 ; *anthers* narrowly elliptic, with a long apical 1-pored beak ; and at the base a short, broad, blunt process from the connective behind, the lobes of the anthers slightly produced in front and minutely tuberculate.

Perak ; *Scortechini* 86 and 150 ; *King's Collector* 1814.

This resembles *M. alternifolia*, Blume, but has a much shorter spur from the connective at the base of the anthers. It has also larger leaves and more numerous flowers in the fascicles.

2. Medinilla speciosa, Blume in Flora, 1831, p. 515. A glabrous shrub or small tree, not epiphytal ; young branches as thick as the little finger, 3- or 4-angled ; the bark shining, pale when dry, bearing at the nodes numerous stout, subulate bristles ·5 in. long. *Leaves* large, subcoriaceous, in whorls of 3 (rarely of 4) or in pairs, sessile, or very shortly petiolate, oblanceolate or obovate-oblong, sometimes elliptic, acute, the base cuneate, nerves 7 to 9 mostly from the midrib above its base, all except the lowest pair bold, the veins slender ; length 6 to 12 in. ; breadth 2·75 to 5 in. *Panicles* lateral and terminal, 4 to 8 or even 14 in. long, on peduncles equally long, many-flowered ; the branches with a whorl of small reflexed bracts at their bases ; whorled, spreading, minutely bracteolate at the divisions. *Calyx-tube* cupular, slightly constricted below the narrow, minutely 4-toothed limb. *Petals* 4, ovate-

acute. *Fruit* ovoid, ·3 in. in diam. Bot. Mag. t. 4321; Morren in Ann. Soc. Hort. Gand. V, 281; Naud. in Ann. Sc. Nat. Ser. 3, XV, 291; Miq. Fl. Ind. Bat. I, pt. I, p. 540; Triana in Linn. Trans. XXVIII, 87; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 549. *Melastoma eximium*, Blume Bijdr. (not of Jack). *Melastoma speciosum*, Reinw. ex Blume, in Flora, 1831, 516.

Malacca; *Maingay* (Kew Distrib.) 798. Penang; *Hullett* 203; *Curtis* 874; *King's Collector* 1595. Perak; *Wray* 3218; *King's Collector* 2652. Distrib. Moluccas, Java, Sumatra.

3. Medinilla heteranthera, King, n. sp. Epipytal and terrestrial; branches slender, smooth, reddish when fresh, drying dark purplish-brown. *Leaves* of the pairs somewhat unequal, ovate-lanceolate to lanceolate, acuminate, the base slightly narrowed, glabrous, 3-nerved; length 2·5 to 5·25 in.; breadth 1 to 1·8 in.; petioles ·3 to ·8 in. *Panicles* terminal on the branches, half as long as the leaves, corymbosely cymose, 5- or 6-flowered, minutely bracteolate. *Flowers* ·75 in. long, their pedicels much shorter. *Calyx-tube* cylindric, the mouth wide and with 4 broad, shallow teeth. *Petals* 4, ovate-lanceolate, shortly acuminate. *Stamens* 8; *anthers* unequal, the larger four twice as long as the shorter four, all curved, much acuminate and with two tubercles at the base in front, the shorter 4 with a short spur on the connective behind, the larger with no spur. *Fruit* globular-ovoid, crowned by the wide calyx-limb, ·35 in. in diam.

Perak; *Scortechini* 341; *King's Collector*, 3291, 3644, 6304, 6904; *Wray* 397; at elevations of from 3000 to 4500 feet.

This resembles *M. Horsfieldii*, Miq.,—a species from Java and Borneo—which however has 5-merous flowers, obovate petals and leaves of thinner texture. According to Scortechini the petals are waxy white tinged with red and the stamens are yellow.

Var. *latifolia*. *Leaves* broadly elliptic, shortly acuminate, the base cuneate, 2·5 to 3·75 in. long and 1·5 to 2 in. broad.

Perak; *King's Collector* 8017; *Wray* 268.

4. Medinilla venusta, King, n. sp. Epiphytal, 2 to 4 feet long, glabrous; branches stout, with large, scattered tubercles, glabrous. *Leaves* large, opposite, thinly coriaceous, sessile, elliptic, shortly acuminate, narrowed to the base, boldly 3-nerved above the base with often a faint, small, basal, marginal pair; length 6 to 9 in.; breadth 2·75 to 4 in. *Cymes* much shorter than the leaves, laxly umbellate, axillary or from the axils of fallen leaves, about 6-flowered; the pedicels slender, bibracteolate at the base. *Flowers* nearly 1 in. long. *Calyx-tube* campanulate, ·35 in. long, with a narrow, obscurely 4-toothed limb.

Petals 4, broadly ovate, acute. *Stamens* 8; *anthers* equal, linear-lanceolate, much acuminate, curved, the tubercles at the front of the base as long as the posterior basal spur from the connective. *Fruit* unknown.

PERAK; *King's Collector* 2390.

5. MEDINILLA HASSELTII, Blume in Flora, 1831, p. 513. Epiphytal on trees, 3 or 4 feet high; branches slender, terete, pale, more or less prominently warted (the warts black). *Leaves* opposite, coriaceous, oblong-lanceolate, acuminate, narrowed to the rounded base, 3-nerved, with sometimes a faint, additional lateral pair; length 4·5 to 5·5 in.; breadth 1·25 to 1·75 in; petioles ·15 to ·35 in. *Cymes* axillary or from the axils of fallen leaves, less than half as long as the leaves, (more than half as long in VAR. *Griffithii*), broader than long; the branches divaricate, 8–12-flowered, minutely bracteolate. *Flowers* ·35 in. long. *Calyx-tube* campanulate-cylindric, somewhat constricted below the minutely 4-toothed mouth. *Petals* 4, obovate-oblong. *Stamens* 8, equal; the anthers linear-oblong, somewhat curved, the base with two short, black, conical protuberances in front and a similar one behind. *Fruit* globular, truncate, ·2 to ·25 in. in diam. Miq. Fl. Ind. I, pt. I, 542; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 547; Cogn. in DC. Mon. Phan. VII, 586. *Melastoma laurifolium* in Wall. Cat. 4084 (not of Blume). *Medinilla crassifolia*, Triana in Trans. Linn. Soc. XXVIII, 86 (in part).

MALACCA; *Griffith* (Kew Distrib.) 2282; *Maingay* (Kew Distrib.) 797, *Wallich* 4084. PERAK; very common. SINGAPORE; *Anderson*. SUNGEI UJONG; *Ridley* 2205, SELANGORE; *Curtis* 2334; *Ridley* 286. PANGKORE; *Curtis* 1642.

DISTRIB. Java, Sumatra.

VAR. *Griffithii*, C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 547. *Cymes* much branched, more than half as long as the leaves, many-flowered.

MALACCA; *Griffith* (Kew Distrib.) 2282.

6. MEDINILLA SCORTECHINII, King, n. sp. Epiphytal, 3 or 4 feet high; stems as thick as a goose-quill, the bark brown (when dry), sparsely verrucellate. *Leaves* opposite, coriaceous, glabrous, sessile, stem-clasping, oblong-ovate to oblong, shortly acuminate, the base sub-cordate, 3-nerved, with occasionally a faint pair at the margin; length 4·5 to 6·5 in.; breadth 1·5 to 2·75 in. *Panicles* cymose, axillary, rather shorter than the leaves, very lax, spreading; the branches slender, minutely bracteolate at the divarications; the branchlets compressed, sometimes 2-winged. *Flowers* nearly ·4 in. long, on pedicels as long as themselves. *Calyx-tube* campanulate, the mouth not much

expanded, obscurely 4-toothed. *Petals* 4, oblong, acute, reflexed. *Stamens* 8; anthers curved, linear-lanceolate, with a short 1-pored apical process; the base with a short, sharp, downward-pointing spur from the connective; the bases of the anther-cells each with a linear, curved, small tubercle as long as the spur, and like it dark in colour when dry. *Fruit* ovoid-globular, ·2 in. in diam.

Perak; *Scortechini* 307, 478, 622; *Curtis* 1297; *Wray* 391, 1739; *King's Collector* 4188.

The nearest ally of this is *M. javanensis*, Bl.

7. Medinilla Maingayi, C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 549. A small epiphyte with slender, terete, pale, smooth branches. *Leaves* opposite, thinly coriaceous, obovate, with rounded apices and cuneate bases, obscurely 3-nerved, the lower surface rather paler than the upper when dry; length ·65 to 1·25 in.; breadth ·5 to ·75 in.; petiole ·05 to ·2 in. *Cymes* much shorter than the leaves, with short, divaricate, broadly bracteolate branches, few-flowered. *Flowers* ·25 in. long, their pedicels shorter. *Calyx-tube* narrowly campanulate, with a slightly expanded, minutely 4-toothed limb. *Petals* 4, lanceolate, sparsely strigose outside. *Stamens* 8; anthers lanceolate, without protuberences at the base in front, but with a short spur behind. *Fruit* unknown. Cogn. in. DC. Mon. Phan. VII, 586.

Malacca; *Maingay* (Kew Distrib.) 806, 807. Perak; *Wray* 3781. Singapore; *Ridley* 1652, 2018. Pahang; *Ridley* 2663.

8. Medinilla Clarkei, King, n. sp. A small epiphyte; young branches with dark, rough, tubercled bark. *Leaves* in whorls of three or four, broadly elliptic to obovate, blunt or subacute, the base cuneate; the upper surface rugulose and green when dry, the lower pale-brown; length 1 to 2·75 in., breadth ·75 to 1·8 in.; petiole ·4 to ·8 in., puberulous. *Cymes* about as long as the leaves or slightly longer, from the axils of fallen leaves, on slender pedicels from ·5 to ·75 in. long, the branches whorled, spreading, minutely bracteolate at the divisions; pedicels slender. *Flowers* 20 to 30, ·3 in. in length. *Calyx-tube* cupular, the mouth truncate and usually obscurely toothed, sometimes distinctly 5-toothed. *Petals* 5, broadly ovate to rotund, blunt. *Stamens* 10; anthers linear-lanceolate; the base with two small tubercles in front, and a small spur behind. *Fruit* globular-truncate, ·15 in. in diam. *M. rosea*, C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 547 (*not of Gaudichaud*).

Malacca; *Griffith* (Kew Distrib.) 2282; *Maingay* (Kew Distrib.) 796; *Stoliczka* in Herb. Calc. Perak; *Scortechini* 243; *Wray* 206, 412, 3831, 4084; *King's Collector* 7333; at elevations of from 3000 to 5000 feet.

M. rosea, Gaud., to which this plant has been referred in the Flora of British India, is a tetramerous species from the Marianne Islands. It has, morever, larger flowers than this and larger, more acute leaves. This plant varies in the size of its leaves: specimens collected at the highest elevations having the largest leaves. The structure of the flowers is, however, uniform.

9. Medinilla crassinervia, Blume in Flora, 1831, 510. Branches with pale bark, the older terete, the youngest striate when dry. *Leaves* in whorls of 3, coriaceous, broadly oblanceolate, or narrowly obovate, shortly and abruptly acuminate, much narrowed to the base, 3-nerved from a little above the base, occasionally with two short lateral faint nerves from the very base; length 3 to 5 in.; breadth 1·5 to 2 in.; petiole ·35 to ·75 in. *Flowers* in short fascicles on the stem below the leaves, in few-flowered pedunculate cymes, mixed with a few solitary, on pedicels ·5 in. long. *Calyx-tube* ovoid-campanulate, the mouth truncate and almost entire. *Stamens* 10, subequal; the basal anterior processes broad and about as long as the filiform posterior spur. *Fruit* globose with a cylindric truncate mouth, ·4 in. across. Blume Rumphia I, 15; Miq. Fl. Ind. Bat. I, pt. I, 545; Cogn. in DC. Mon. Phan. VII, 574. *M. macrocarpa*, Clarke (not of Blume) in Hook. fil. Fl. Br. Ind. II, 547.

Singapore; *Ridley* 1637. Penang; *Curtis* 2225. Perak; *Wray* 1821. Malacca; *Maingay* (Kew Distrib.) 799. Distrib. Borneo.

True *M. macrocarpa*, Bl., is represented in the Kew Herbarium by a single specimen collected by Blume in the Moluccas. The flowers on it have, as described by the author of the species, an irregularly toothed calyx-limb. The plant now described differs in having an almost entire truncate limb, and I follow Cogniaux in referring it to *M. crassinervia*, Bl. In the Flora of British India it is, however, referred to *M. macrocarpa*, Bl.

10. Medinilla perakensis, King, n. sp. Epiphytal; branches terete, glabrous, tubercled. *Leaves* in whorls of 3 or 4, coriaceous, elliptic-rotund, blunt, the base rounded and narrowly cordate, glabrous; 5-nerved, the lateral pair of nerves faint; length 2·5 to 5·5 in.; breadth 1·75 to 3·75 in.; petioles ·6 to 1·2 in. *Panicles* cymose, on rather long peduncles from the axils of fallen leaves, shorter than the leaves, lax, 12- to 20-flowered; branches spreading, whorled, 2–3-chotomous. *Flowers* ·5 in. long, their pedicels ·35 in. *Calyx-tube* cupular; the limb but little expanded, cut into 5 shallow, broad teeth. *Petals* 5, oblong. *Anthers* 10, curved, with 2 yellow tubercles at the base in front and a short spur behind from the connective. *Fruit* ·35 in. in diam.; the seeds oblong, obtuse, with an excurrent tail, the testa pitted.

Perak; *Scortechini* 410; *Wray*.

Collected only by the late Father Scortechini and Mr. Wray. According to the field-note of the former, the petals and anthers are white and the fruit blueish-

carnation. The nearest ally of this is *M. montana*, Cogn.—a New Guinea species—which has however, longer flowers, a wider calyx-tube, more slender branches which are moreover smooth, and narrower leaves narrowed at the base.

14. Pogonanthera, Blume.

Shrubs; branches round, minutely scaly. *Leaves* opposite, petioled, oblong or ovate, entire, glabrous, 3-nerved. *Flowers* small, pulverulent, in small, terminal panicles having opposite, cymose branches. *Calyx-tube* narrowly campanulate, subquadrangular; limb 4-toothed. *Petals* 4, oblong-lanceolate. *Stamens* 8, equal; anthers oblong, acute, opening by a terminal pore, not produced at the base; connective at the base bearded behind with a tuft of hairs, not spurred. *Ovary* half-inferior, 4-celled, with a tuft of hairs at the apex; style filiform; ovules very many, placentas axile. *Berry* small, globose, 4-celled, crowned with the calyx-limb. *Seeds* very many, obovoid-oblong, smooth. Distrib. Species 2; Malayan.

Pogonanthera pulverulenta, Blume in Flora, 1831, 521. An epiphytic shrub, all parts (but especially the calyx-tube) bearing pale yellow scales; the stems sparsely lenticellate. *Leaves* rather fleshy, ovate-oblong to oblong-lanceolate, acute or shortly acuminate, the base more or less narrowed and bituberculate, 3–5-nerved; the margins obscurely crenate and slightly reflexed; upper surface glabrous, the lower paler and minutely pulverulent; length 3 to 6·5 in.; breadth 1·75 to 3 in.; petiole ·25 to ·6 in., stout. *Panicles* terminal, 2 to 3 in. long and equally broad, cymose, the branches spreading. *Calyx-tube* sub-cylindric, constricted below the expanded 4-toothed mouth, very scaly. *Petals* 4, oblong, densely scaly externally. *Stamens* 8; anthers lanceolate, the connective with a tuft of hairs at the base behind. *Fruit* pisiform, ·15 in. in diam. Korth. Verh. Nat. Gesch. Bot. t. 65; Griff. Notul. IV. 678; Miq. Fl. Ind. Bat. I, pt. I, 553; Triana in Trans. Linn. Soc. XXVIII, 89; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 550; Cogn. in DC. Mon. Phan. VII, 610. *P. reflexa*, Blume in Flora, 1831, 521; Mus. Bot. Lugd. Bat. I, 24; Naud. Ann. Sc. Nat. Ser. 3, XV, 303, tab. 15, fig. 1; Triana l.c. 89; Beccari Malesia, II, 241, tab. LIX, 4–5. *P. squamulata*, Korth. (ex Blume) Mus. Bot. I, 24. *Melastoma reflexa*, Reinw. ined. (ex Blume in Flora, 1831, 521). *M. rubicunda*, Jack in Trans. Linn. Soc. XIV, 19; Wall. Cat. 4086. *M. pulverulenta*, Jack in Trans. Linn. Soc. XIV, 19; DC. Prodr. III, 149; Blume in Bijdr., 1072.

Singapore; Perak; Malacca; Penang; common. Distrib. Java, Sumatra, Borneo.

I have followed Mr. Clarke in reducing *P. reflexa*, Bl. here, as I can find no tangible character to separate it. *P. reflexa* is said to have white tumid petals not toothed on the margin, while typical *P. pulverulenta* is described as having red petals with a single tooth on each margin. The union of the two species was suggested by Naudin.

15. Pachycentria, Blume.

Glabrous, often scandent shrubs, with cylindric or obscurely angled, pulverulent branches. *Leaves* somewhat fleshy, oblong or ovate-lanceolate, entire or obscurely crenulate. *Flowers* small, rose-coloured, corymbose, the pedicels 2-bracteolate, 4-merous. *Calyx-tube* ovoid or turbinate, the part beyond the ovary angular, constricted below the obscurely 4-toothed mouth. *Petals* ovate or oblong, subacute or acuminate. *Stamens* 8, equal; anthers linear-oblong or subulate, rostrate at the apex and minutely 1-pored; the connective not produced at the base, inappendiculate in front but minutely spurred at the back. *Ovary* adherent beyond its middle, 4-celled, its apex free, conic, angled; style filiform, the stigma obtuse or capitate. *Berry* globose, crowned by the limb of the calyx. *Seeds* dimidiately obovoid, the raphe lateral. Distrib. About 12 species, all Malayan.

Pachycentria tuberculata, Korth. Ver. Nat. Gesch. Bot. 246, t. 63. Epiphytic; branches as thick as a swan's quill, glabrous below but with rusty scurf near the apices, the bark pale; the roots bearing woody tubercles. *Leaves* somewhat fleshy, narrowly elliptic-oblong, subacute, narrowed at the base, the edges entire, 3-nerved; length 2·5–4·5 in.; breadth ·9–1·25 in.; petioles ·15–·2 in. *Panicles* terminal or axillary, pedunculate; the branches spreading, cymose, 2–2·5 in. long and as wide. *Flowers* ·25 in. long, the pedicels shorter. *Calyx-tube* campanulate, the mouth truncate, obscurely 4-lobed. *Petals* 4, lanceolate. *Stamens* 8, equal, shortly spurred at the base behind. *Fruit* globular, glabrous, ·15 in. in diam. Blume, Mus. Bot. Lugd. Bat. I, 23; Miq. Fl. Ind. Bat. I, pt. I, 552; Triana in Linn. Trans. XXVII, 89, tab. VII, fig. 95*a*.

Perak; *King's Collector* 1707, 10569; *Wray* 3422; *Scortechini* 260, 550, 1961. Singapore; *Anderson* 55. Penang; *Curtis* 347; *Hullett* 158. Distrib. Borneo, Burma (Tenasserim, *Griffith*).

16. Astronia, Blume.

Shrubs with opposite, petioled, ovate or oblong, entire, 3-nerved leaves. *Flowers* in terminal panicles, small, white or purple. *Calyx-tube* campanulate; limb irregularly truncate or 3–8-lobed. *Petals* 4–5. *Stamens* 8–10–12, equal; filaments short, broad; anthers short, obtuse,

opening by slits down the front, connective spurred at the base or unappendaged. *Ovary* inferior, 2–5-celled, glabrous at the apex; style short, stigma capitellate; ovules numerous, placentas axile, nearly basal. *Capsule* finally breaking up irregularly. *Seeds* very many, linear, raphe excurrent.—Distrib. Species 24; in Malaya and the Pacific Islands.

Astronia smilacifolia, Triana in Trans. Linn. Soc. XXVIII, 152. Young shoots, petioles, under surfaces of the young leaves and inflorescence rufous-lepidote. *Leaves* oblong, tapering to each end, the transverse nerves stout and distant; length 3·5–5·5 in., breadth 1·5–2·5 in.; petiole ·75–1 in. *Panicle* usually terminal, condensed, 1–2 in. in diam.; branches numerous, short, the pedicels shorter than the globular, minutely 5-toothed calyx-tube. *Petals* reflexed, obovate. *Fruit* subglobular, truncate at the apex, ·25 in. in diam. C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 550; Cogn. in DC. Mon. Phan. VII, 1094. *Melastoma smilacifolia*, Wall. Cat. 4057.

Penang; *Wallich, Curtis.* Malacca; *Maingay* (K.D.) 808. Perak; *Scortechini* 683; *Wray* 2813.

Var. *lepidophylla*, Scort. MSS. Arboreous; inflorescence, leaves on the under surface and petioles (when young) densely covered with deciduous scales.

Perak; *Scortechini* 1875; *King's Collector* 7270, 2027.

This variety is described by Scortechini and Kunstler as a tree 50–80 feet high, the typical form never being more than a large bush.

17. Pternandra, Jack.

Large shrubs or trees, glabrous or minutely pubescent. *Leaves* sub-coriaceous or coriaceous, opposite, short-petioled or sub-sessile, entire, 3–5-nerved. *Flowers* solitary and axillary on long peduncles, or in axillary or teminal, often very short, and clustered cymes; the pedicels often 2-bracteolate. *Calyx-tube* campanulate or hemispheric, tesselate, verrucose, or covered with more or less adpressed, often puberulous scales the mouth truncate, often 4-toothed. *Petals* 4, ovate or oblong, blueish or white. *Stamens* 8, equal in length, but the anthers of some of them often imperfect, perfect anthers broad, blunt, shortly spurred behind but never in front, dehiscing by slits, the filaments stout, often geniculate. *Ovary* inferior, 4-celled: the apex glabrous, depressed or flat; *style* filiform; *stigma* clavate; *ovules* numerous, placentas sub-basal. *Berry* subglobose or ovoid, truncate or surmounted by the calyx-teeth, scaly or smooth. *Seeds* cuneate-ovoid, or obovoid, angular.—Distrib. Species about 12; in Malaya and the Philippines.

Calyx-tube tesselate outside, not covered with distinct scales ... ... 1. *P. cœrulescens.*

Calyx-tube covered with large distinct scales :—

Young branches and under surfaces of leaves rusty-pubescent; calyx-tube ·2–·3 in. long, covered with more or less spreading scales; teeth of calyx spreading, elongate, acuminate ... ... 2. *P. echinata.*

Young branches and under surfaces of leaves glabrous; calyx-tube ·15 in. long, its scales adpressed; teeth of calyx broadly triangular, blunt, reflexed ... ... 3. *P. Griffithii.*

1. Pternandra cœrulescens, Jack in Mal. Misc. II, 61. A tree; young branches cylindric with deciduous, dark-brown, glabrous bark and slightly thickened nodes with obscure transverse ridges. *Leaves* chartaceous or sub-coriaceous, broadly ovate, ovate-lanceolate, ovate-oblong or elliptic, much narrowed at the base, the apex shortly acuminate, 3–5-nerved; both surfaces glabrous; length 2·5–5 in. (10 in. in var. 2); breadth 1·25–2·5 in., (to 5 in. in var. 2) petiole ·1–·2 in. *Flowers* in short, axillary, pedunculate cymes (often several from one axil), or in terminal cymes, shorter than the leaves. *Calyx-tube* cylindric-campanulate, ·15 in. long, tesselate; the mouth truncate but with 4 small, erect, triangular teeth. *Petals* thick, ovate, reflexed after expansion. *Stamens* 8, equal in length; the filaments short, geniculate; perfect anthers 4 or 5, broadly ovate, blunt, shortly spurred behind, the remaining 3 or 4 imperfect, as long as but much narrower than the perfect. *Fruit* turbinate or sub-hemispheric, truncate, nearly smooth, ·15–·3 in. in diam. Wall. Cat. 4077; Triana in Trans. Linn. Soc. XXVIII, 153; Kurz, For. Fl. I, 509 and in Journ. As. Soc. 1877, pt. II, 79; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 551; Cogn. in DC. Mon. Phan. VII, 1103. *Ewyckia cyanea*, Blume Rumph. I. 24, t. 8; Miq. Fl. Ind. Bat. I, pt. I, 568; Triana l.c. *E. Jackiana*, Walp. Rep. V. 724. *Apteuxis trinervis*, Griff. Notul. IV, 672.—*Nov. Gen.* Roxb. Fl. Ind. II, 225.

In all the provinces except the Andaman Islands.

A common and variable plant of which four forms seem worthy of separation as varieties. These, however, pass into each other by numerous connecting specimens. One variety (*Jackiana*) differs from the typical-plant in having few-flowered almost sessile cymes; a second (*capitellata*) has sub-sessile cymes and much larger leaves and the third (*paniculata*) is probably only an example of fasciation.

Var. 1. *Jackiana*, Clarke in Fl. Br. Ind. II, 551. *Flowers* in very short, few-flowered, almost sessile, axillary cymes. *Leaves* as in the typical form but with slightly longer petioles.

In all the provinces except the Andaman and Nicobar Islands, equally abundant with the typical form.

Var. 2. *capitellata*, King. *Leaves* thicker in texture than in the typical form (sub-coriaceous), broadly elliptic to sub-orbicular, with 3 very strong nerves and a fainter marginal pair; length 4·5–10 in.; breadth 2·75–5 in., petiole ·2–·3 in. *Flowers* in dense, very shortly-stalked, axillary glomeruli composed of numerous 3-flowered cymes very much shorter than the leaves. *Pternandra capitata*, Jack in Mal. Misc. II, addenda prefixed to the paper p. 3; Wall. Cat. 4079; W. and A. Prodr. 325; Triana in Trans. Linn. Soc. III, 153; Kurz, For. Fl. I, 509 and in Journ. As. Soc. 1877, pt. II, 79; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 551; Cogn. in DC. Mon. Phan. VII, 1103. *Ewyckia capitellata*, Walp. Rep. V, 724; Miq. Fl. Ind. Bat. I, pt. I, 568. *E. medinilliformis*, Naud. in Ann. Sc. Nat. Ser. 3, XVIII, 261.

Singapore; *Wallich* 4079. Penang; *Curtis* 67; *King*. Perak; *Scortechini* 43, 1043; *Wray* 1971. Malacca; *Maingay* 802 (K.D.); *Helfer* (K.D.) 2279.

Var. 3. *paniculata*, King. *Flowers* in large, lax, terminal, much branched, few-flowered, leafy and bracteolate panicles. *Leaves* of the stem 2–6 in. long and from ·9–2·75 in. broad, those of the panicle from ·75–2 in. long and ·15–·8 in. broad. *P. paniculata*, Benth. in Wall. Cat. 4080; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 551; Cogn. in DC. Mon. Phan. VII, 1104. *Ewyckia latifolia*, Blume Mus. Bot. I, 6. *E. cyanea*, var. *latifolia*, Korth. ex Miq. Fl. Ind. Bat. I, pt. I, 568. *E. paniculata*, Miq. l.c. Suppl. 321. *Pternadra latifolia*, Triana in Linn. Trans. XXVIII, 153.

Penang; *Wallich* 4080; *Curtis* 2768. Malacca; *Griffith* (K.D.) 2273. Perak; *Scortechini* 248, 1303; *Wray* 92. Distrib.; Borneo, Bangka.

2. Pternandra echinata, Jack, Mal. Mis. II, n. 9 and add. prop. 3. A small tree; young branches quadrangular, thickened and with transverse ridges at the nodes, minutely rusty-pubescent. *Leaves* sub-coriaceous, boldly 3-nerved, lanceolate or oblong-lanceolate, 3-nerved, narrowed to the base, shortly acuminate at the apex; upper surface glabrous; the lower puberulous or sub-glabrous, minutely reticulate; length 2·5–4·5 in.; breadth ·75–1·75 in.; petiole ·05–·2 in. *Flowers* axillary and solitary on pedicels longer than themselves, or in threes in terminal pedunculate cymes, the pedicels of both sets of flowers with one or more pairs of curved, linear-oblong bracteoles. *Calyx-tube* widely campanulate, ·2–·3 in. long, closely covered with triangular rusty-pubescent scales, those nearest the mouth longest, most acute, and most persistent; the mouth truncate and with 4 narrow, acuminate teeth. *Petals* broadly ovate-quadrate, abruptly and shortly acute, the edges undulate, blue. *Anthers* broadly ovate, on thick short filaments.

Fruit sub-hemispheric, truncate, sub-echinate, ·35 in. in diam. Wall. Cat. 4078. *Kibessia echinata*, Cogn. in DC. Mon. Phan. VII, 1108. *Kibessia simplex*, Korth. Verh. Nat. Gesch. Bot. 253; Blume, Mus. Bot. I, 9; Triana in Trans. Linn. Soc. XXVIII, 152; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 552. *Kibessia cupularis*, Dcne in Deless. Ic. Sel. V, t. 5; Ann. Sc. Nat. Ser. 3, XV, 317. *K. acuminata*, Dcne in Ann. Sc. Nat. Ser. 3, V, 316; Triana in Trans. Linn. Soc. XXVIII, 153.

Malacca and Singapore; not uncommon; many collectors.

I cannot see how *K. acuminata*, Dcne, is to be distinguished as a [illegible] and I reduce it here without any hesitation.

Var. *pubescens*, King. Bases of leaves somewhat rounded and sub-cordate; young branches, under surfaces of leaves and panicles with much minute rusty pubescence. *P. echinata*, Jack, Wall. Cat. 4078*a*. *Kibessia pubescens*, Dcne in Ann. Sc. Nat. Ser. 3, V, 318; Triana in Linn. Trans. XXVIII, 152; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 552; Cogn. in DC. Mon. Phan. VII, 1108.

Penang, Malacca, Perak.

I cannot see what claim this has to specific rank. To me it appears to be a variety and not a very distinct one of *P. echinata*, Jack. Wallich did not even regard it as a variety and issued it as true *P. echinata*. This form, in the three provinces where it occurs, appears to be very common.

3. Pterandra Griffithii, King, n. sp. A small tree; young branches cylindric, very little thickened at the nodes, glabrous. *Leaves* thinly coriaceous, elliptic to ovate-oblong, narrowed at the non-cordate (cordate in var.) base, the apex very shortly acuminate or acute, 3-nerved; both surfaces glabrous, shining; length 2·25–4 in.; breadth 1–2 in.; petiole ·15–·2 in. *Flowers* in 2–3- rarely 5–7-flowered, axillary, bracteolate cymes shorter than the leaves, rarely in crowded, terminal cymes; bracteoles ovate, acute, minute. *Calyx-tube* widely campanulate, ·15 in. long, covered with adpressed, triangular, puberulous scales; the mouth with 4 large, blunt, triangular teeth. *Petals* orbicular-ovate, undulate, abruptly and shortly apiculate-spreading, not calyptrate. *Stamens* 8, equal; the anthers short, thick, about as long as the filaments, gibbous at the base behind, inserted at an obtuse angle on the filaments. *Fruit* globular-ovoid, truncate at the mouth, covered by the persistent scales, under ·2 in. in diam.

Malacca; *Griffith* (K.D.) 2272/1; Penang; *Curtis* 953.

Griffith's specimens of this (2272/1) have been referred by M. Cogniaux (DC. Mon. Phan. VII, 1110) to *Rectomitra tuberculata* Bl., but comparison in the Kew Herbarium with two authentic specimens of that plant collected in Sumatra and

issued from the Leiden Herbarium shew that this differs from Blume's plant. Specimens of this were originally collected by Griffith in 1845, and as none had been gathered until Curtis's in 1886, the species is presumably a rare one.

VAR. *cordata*, King. Leaves with cordate bases.
PENANG; *Curtis* 453. PERAK; *Wray* 1994.

18. MEMECYLON, Linn.

Shrubs or *trees*, glabrous. *Leaves* opposite, short-petioled or sessile, coriaceous or sub-coriaceous, orbicular, ovate or lanceolate, entire, pinnate-nerved or rarely 3-nerved. *Flowers* usually in small, axillary, rarely terminal, simple or panicled cymes or umbels. *Calyx-tube* campanulate, glabrous; limb dilated, truncate or shortly 4-lobed. *Petals* 4, blue or white, rarely reddish. *Stamens* 8, equal, filaments long; anthers short, opening by slits in front, connective ending in a horn behind. *Ovary* inferior, 1-celled; apex glabrous, surmounted by a convex or depressed disc with 8 radiating grooves; style filiform, simple; ovules 6–12, whorled on a free-central placenta. *Berry* globose or ellipsoid, crowned with the calyx-margin, 1-seeded. *Seed* large, cotyledons convolute.—DISTRIB. Species about 130; numerous in South-East Asia and its islands; a few extending into Polynesia and Australia, several in tropical Africa.

Leaves boldly 3-nerved from base to apex ... ... 1. *M. oligoneuron.*
Leaves with pinnate nervation, sessile or subsessile:—
Main nerves of leaves distinctly visible when dry, interarching but not forming (except in No. 3) a bold intramarginal nerve; leaves thinly coriaceous or membranous, small, not exceeding 4 in. in length:—
Young branches boldly 4-angled or winged; inflorescence very shortly stalked (the stalk not manifest):—
Young branches 4-winged:—
Cymes solitary, 3- or 4-flowered; leaves narrowly lanceolate, ·6 to 1 in. broad ... ... 2. *M. epiphyticum.*
Cymes solitary, 8- to 10-flowered; leaves ovate- or oblong-lanceolate, 1·35 to 1·85 in. broad ... 3. *M. fruticosum.*
Cymes several from the same axil, compoundly umbellate, 1·5 to 2·5 in. long, many-flowered, pubescent; leaves elliptic much narrowed to each end ... ... 4. *M. pubescens.*
Young branches 4-angled, never winged and sometimes sub-terete:—
Cymes 3- to 5-flowered: leaves lanceolate, 1 to 2 in. broad ... ... 5. *M. dichotomum.*
Young branches terete; inflorescence with a manifest peduncle ... ... 6. *M. Kunstleri.*

Main nerves of leaves distinct when dry, prominent on the lower surface and anastomosing with a bold intramarginal line, coriaceous, more than 4 in. long :—

Inflorescence manifestly pedunculate :—

Peduncles several in each axil, many-branched ; fruit ellipsoid ... ... 7. *M. caloneuron.*

Peduncles solitary, few-branched ; fruit globular ... 8. *M. Hullettii.*

Inflorescence sessile or on a very short peduncle :—

Flowers large, the mouth of the calyx ·2 in. in diam. :—

Arboreous ; leaves sub-acute ; flowers in fascicles of 12 to 20, their pedicels ·15 in. long, stout ; calyx truncate, not toothed ... ... 9. *M. Maingayi.*

Shrubby ; leaves acuminate ; cymes 3- or 4-flowered ; pedicels ·4 in. long, slender ; calyx-limb 4-toothed 10. *M. Kurzii.*

Flowers small ; mouth of the calyx under ·2 in. in diam. :—

Leaves slightly narrowed or rounded at the base, rarely minutely sub-cordate :—

Young branches not winged below the nodes ; main nerves of leaves 18 to 20 pairs ; fruit ·7 in. in diam. ... ... 11. *M. heteropleurum.*

Young branches with 4 short wings below each node (sometimes obscure) ; main nerves 12 to 14 pairs ; fruit ·35 in. in diam. ... ... 12. *M. costatum.*

Leaves distinctly cordate at the base and quite sessile, amplexicaul ... ... 13. *M. amplexicaule.*

Main nerves of leaves indistinct on both surfaces when dry ; leaves coriaceous or thinly so :—

Leaves with broad cordate bases, sessile, amplexicaul :—

Branches terete, fruit large, globular ... ... 14. *M. microstomum.*

Branches 4-angled ; fruit ellipsoid ... ... 15. *M. coeruleum.*

Leaves much narrowed at the base, never cordate, petiolate :—

Inflorescence in axillary glomeruli or in very shortly-peduncled (not manifest) cymes :—

Mouth of calyx entire in the expanded flower :—

Flowers in fascicles, their pedicels slender ; leaves often 4 in. long ; leaves brown underneath when dry ... ... 16. *M. campanulatum.*

Flowers in short umbellate sub-sessile cymes ; young branches bi-sulcate : fruit globular ; leaves pale yellowish underneath when dry ... 17. *M. minutiflorum.*

Mouth of calyx 4-toothed :—

Teeth of calyx long, sharp, its fundus narrowed ; flower buds narrowly conical ; cymes many-flowered ; fruit globular, ·2 in. in diam. ; leaves shortly acuminate, 1·5 to 2·5 in. long ... 18. *M. myrsinoides.*

Teeth of calyx short, acute, its fundus narrow ; cymes few-flowered, fruit globular, ·3 in. in diam. ; leaves very acuminate, 2 to 2·5 in. long... 19. *M. laevigatum.*

Teeth of calyx short, acute, its fundus rounded; fruit globular, ·25 in. in diam.; flower pedicels with acicular bracteoles; leaves much acuminate, 2·8 to 5·5 in. long ... ... 20. *M. cinereum.*

Inflorescence manifestly pedunculate :—

Fruit ellipsoid :—

Young branches terete; calyx-limb truncate; leaves elliptic-oblong or elliptic, 2·5 to 4·75 in. long ... ... 21. *M. oleaefolium.*

Fruit globular :—

Branches 4-angled :—

Leaves rhomboid or elliptic-rhomboid; inflorescence under ·5 in. long; calyx saucer-shaped with wide, minutely 4-toothed mouth; fruit ·2 in. in diam. ... ... 22. *M. pauciflorum.*

Leaves oblong to elliptic, much tapered to each end; inflorescences 1 in. or more in length, several in each axil; calyx with narrow fundus, the mouth wide (·1 in.) and obscurely 4-toothed; fruit ·5 in. in diam. ... ... 23. *M. elegans.*

Branches terete :—

Mouth of calyx with 4 broad, shallow teeth; flowers 4 to 6 in a compound umbel; fruit ·25 in. in diam.; leaves caudate-acuminate ... 24. *M. acuminatum.*

Mouth of calyx truncate or with 4 obscure teeth :—

Cymes many-flowered, on peduncles not longer than the leaf-petioles; calyx with wide, obscurely toothed mouth and narrow, cup-shaped tube; young branches not bi-sulcate ... ... 25. *M. garcinioides.*

Cymes or peduncles very slightly if at all longer than the petioles; calyx not toothed; young branches deeply bi-sulcate under the nodes ... ... 26. *M. andamanicum.*

Cymes or peduncles several times longer than the leaf-petioles :—

Peduncles solitary; leaves thinly coriaceous ... ... 27. *M. intermedium.*

Peduncles several from the same axil; leaves coriaceous ... ... 28. *M. edule.*

1. MEMECYLON OLIGONEURON, Blume, Mus. Bot. I, 354. A small tree or shrub; young branches slender, terete, their bark pale-brown. *Leaves* thinly coriaceous, brown below, greenish brown above when dry, oblong to ovate- or elliptic-oblong, shortly and obtusely acuminate, boldly 3-nerved from the cuneate base, transverse nerves invisible; length 2–4 in.; breadth 1·3–1·65; petiole ·05–·15 in. *Flowers* small

(·05 in. long), on pedicels about ·1 in. long, densely crowded in clusters on small tubercles in the axils of leaves or of fallen leaves. *Calyx-tube* cupular, but little contracted at the base, the mouth wide with four broad shallow teeth. *Fruit* unknown. Miq. Fl. Ind. Bat. I, pt. 1, 574; Cogn. in DC. Mon. Phan. VII, 1132. *M. trinerve*, Hassk. Cat. Hort. Bog. 259 (not of DC.). *Myrtus oligoneura*, Korth. ex Blume l.c. 354.

Perak; *Scortechini* 1309; *King's Collector* 2513, 10280. Penang; *Curtis* 1065, 1446, 2220, 10920. Distrib. Java, Borneo.

A species easily recognised by its 3-nerved leaves.

2. Memecylon epiphyticum, King, n. sp. An epiphytic shrub; branches rather stout, strongly angled and with short ear-like projections just below the nodes. *Leaves* thinly coriaceous, narrowly oblong-lanceolate, acute or acuminate, somewhat narrowed to the rounded sub-cordate base; main nerves 9 or 10 pairs, indistinct on the lower surface, invisible on the upper; length 1·75–3 in.; breadth ·6–1 in.; petiole ·05 in. *Cymes* in pairs, axillary, 3–4-flowered, on slender pedicels ·1–·15 in. long, bracteate at the apex; pedicels half as long as the peduncle. *Calyx-tube* cupular, rounded at the base; the mouth deep and wide (·05 in. across), undulate, truncate. *Fruit* globular, smooth, ·25 in. in diam.

Perak; on trees, *King's Collector* 5184; *Wray* 2727.

A species allied to *M. dichotomum*, Clarke, but with smaller leaves, more boldly angled branches, smaller, less numerous flowers, and cymes on more slender peduncles.

3. Memecylon fruticosum, King, n. sp. A shrub, 6–8 feet high; young branches boldly 4-winged especially near the slightly thickened nodes, the bark pale-brown. *Leaves* ovate-lanceolate or oblong-lanceolate, chartaceous, shortly acuminate, slightly narrowed to the rounded base; main nerves 7–9 pairs, interarching ·15 in. from the margin, somewhat conspicuous on the lower but indistinct on the upper surface; length 3–4 in.; breadth 1·35–1·85 in.; petiole ·05 in. *Cymes* usually in pairs, axillary, on short peduncles, 8-10-flowered. *Flowers* on pedicels with acute bracteoles at their bases. *Calyx-tube* shortly campanulate, tapering much to the base (obconic), the mouth ·075 in. wide, with 4 shallow obscure teeth, or truncate; the buds not very conical. *Fruit* globose-ovoid, constricted below the thick persistent calyx-limb, ·35 in. long and ·25 in. in diam. (unripe).

Perak; *King's Collector* 2971, 3265, 3425.

Approaching *M. dichotomum* and *M. sub-dichotomum* but with differently shaped fruit.

4. Memecylon pubescens, King. A tree, 30–70 feet high; young branches somewhat slender, pale-brown, 4-angled. *Leaves* coriaceous,

elliptic, shortly and abruptly acuminate, the base much narrowed; yellowish green on the lower surface and olivaceous on the upper when dry; main nerves 7–10 pairs, quite distinct on the lower surface, less so on the upper, curved and interarching ·1 in. from the margin. *Cymes* 1–3 from the axils of leaves, often unequal, proliferously umbellate, from 1·5–2·5 in. long, always pedunculate, the peduncle and all its branches 4-angled, bracteolate at the divisions, sparsely and deciduously rusty-pubescent. *Flowers* densely clustered at the apices of the thickened secondary peduncles, pedicellate; the pedicels with numerous sharply acuminate bracteoles at their bases. *Calyx-tube* campanulate, much narrowed at the base, the mouth rather more than ·05 in. wide, truncate but with 4 minute, acicular teeth. *Fruit* globular, ·15 in. in diam. (unripe). *M. grande*, Retz., var. *pubescens*, Clarke in Hook. fil. Fl. Br. Ind. II, 558; Cogn. in DC. Mon. Phan. VII, 1153.

Malacca; *Griffith* (Kew Distrib.) 2336. Perak; *King's Collector* 6089, 10760. Singapore; *Ridley* 10390.

Ripe fruit of this is unknown.

5. Memecylon dichotomum, C. B. Clarke in Herb. Kew. A slender shrub, 6–8 feet high; young branches slender, acutely 4-angled (even 4-winged) below the slightly thickened nodes; the bark pale-brown. *Leaves* thinly coriaceous, almost sessile, lanceolate to ovate-lanceolate, much acuminate, often caudate; the base rounded or slightly narrowed; main nerves 6–8 pairs, curved, interarching rather far from the margin, often indistinct; length 2·5–4 in.; breadth 1–2 in.; petiole very short (under ·05 in.). *Cymes* 2–5-flowered, solitary, axillary and terminal; peduncles very short, 4-angled; pedicels with two ovate, acute bracteoles at their apices embracing the calyx. *Calyx-tube* campanulate, tapering to the base (obconical); minutely glandular outside when dry, the mouth with 4 broad, shallow lobes when young, truncate and almost entire when old; buds rather large, conical. *Fruit* globular, crowned by the narrow calyx-limb, smooth when ripe, about ·5 in. in diam. *M. elegans*, var. *dichotoma*, C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 554; Cogn. in DC. Mon. Phan. VII, 1138.

Malacca; *Griffith* (Kew Distrib.) 2324; *Maingay* (K.D.) 818, 820. Perak; *Wray* 2989; *King's Collector* 3239, 5036, 5297, 10783. Pahang; *Ridley* 2609.

I restore for this species the MS. name originally given to it by Mr. C. B. Clarke in the Kew Herbarium. Mr. Clarke subsequently reduced it, as a variety, to *M. elegans*, Kurz, of which there were, at the time he made the reduction, no good specimens. Now that there are excellent examples of *M. elegans*, it is clear that *M. dichotomum* is not near that species.

There are specimens in the Calcutta Herbarium of what appear to be other species allied to this. But the material of all is imperfect and I describe none of them.

6. Memecylon Kunstleri, King, n. sp. A tree, 40–60 feet high; young branches slender, terete, very pale-grey. *Leaves* chartaceous, drying brown (palest on the lower surface), elliptic-oblong, bluntly acuminate, the base rounded and often minutely cordate; main nerves 7 or 8 pairs, ascending, faint on the lower and almost invisible on the upper surface when dry; length 2·75–4·5 in.; breadth 1–2 in.; petiole ·05–·1 in. *Peduncles* from the axils of fallen leaves or axillary, bracteolate, ·35–·6 in. long, umbellately panicled, bracteolate at the divisions, 4-angled like the pedicels; ultimate umbels 4–6-flowered, on the thickened ends of the secondary peduncles, pedicels bracteolate at the base. *Calyx-tube* cup-shaped, shallow, the mouth obscurely 4-toothed. Young fruit ellipsoid, crowned by the thick, shallow, obscurely 4-toothed limb of the calyx, ·3 in. long, and ·15 in. in diam.

Perak; *King's Collector* (Kunstler) 8195, 10419.

This is known only by Mr. Kunstler's two suites of specimens. One of these sets bears no fruit; the other no flowers. The leaves on the former are rather smaller than those on the second but the venation is the same and I assume that they belong to one species. The terete branchlets, associated as they are with an inflorescence which is 4-angled in all its branches, even down to the pedicels and the ellipsoid fruit, distinguish the plant.

7. Memecylon caloneuron, Miq. Fl. Ind. Bat. Suppl. 321. A tree; branchlets and leaves as in *M. costatum*, Miq., but the latter with fewer nerves. *Flowers* in axillary, pedunculate, many-branched cymes, 1–2 in. long, the flowers in dense glomeruli on the thickened apices of the ultimate branchlets; all the peduncles boldly 4-angled or winged; fruit ellipsoid, ·35 in. long (including the small persistent calyx-limb). *M. costatum*, Miq., var. *ellipsoidea*, Blume Mus. Bot. I, 361; Cogn. in DC. Mon. Phan. VII, 1136.

Malacca; *Maingay* (Kew Distrib.) 813. Perak; *Wray* 3235; *King's Collector* 6945, 8505. Distrib. Java; Sumatra, *Forbes* 2696; Borneo.

The inflorescence and fruit are so different from those of *M. costatum*, Miq., that I have followed Miquel in treating this as a species. Miquel did not however, recognise that his *M. caloneuron* really covers Blume's variety *ellipsoidea* of his own species *M. costatum*.

8. Memecylon Hullettii, King, n. sp. Young branches slightly ridged near the nodes, otherwise terete, the bark pale-brown. *Leaves* chartaceous, ovate-oblong, gradually narrowed to the acuminate apex; the base broad, abruptly rounded, slightly cordate; main nerves about 15 pairs, thin but distinct on the lower surface, horizontal; length 6–8 in.; breadth 2·25–3 in.; petiole under ·1 in. *Peduncle* solitary, axillary, 1·5–2·5 in. long, slender, bearing at its apex a single or compound

few-flowered umbel; the flower-pedicels longer than the calyx and, like the peduncles of the secondary umbels, rugulose. *Calyx-tube* campanulate, narrowed to the base; the mouth truncate, with 4 very obscure shallow teeth. *Fruit* globular, crowned by the rather large calyx-limb, ·25 in. in diam. (not quite ripe).

Johore; on Gunong Pulai, *Hullett* and *King* 253; *Lake* and *Kelsall* 4073.

A very well-marked species near *M. amplexicaule*, Roxb., at once distinguished by its elongately acuminate, broad-based leaves and long-peduncled umbels.

9. Memecylon Maingayi, Clarke in Hook. fil. Fl. Br. Ind. II, 557. A tree, 20–40 feet high; branches stout, terete, somewhat thickened at the nodes, the bark pale-brown when dry. *Leaves* coriaceous, nearly sessile, elliptic-oblong, sub-acute, slightly narrowed to the rounded, sometimes slightly cordate base; in length 6·5–9 in.; breadth 3–4·25 in.; main nerves 12–15 pairs, not very prominent, interarching inside the margin. *Flowers* large for the genus, in few-flowered (12–20) fascicles from the axils of the leaves or of fallen leaves; peduncles and pedicels about ·15 in. long, bracteolate. *Calyx-tube* widely cupular, truncate, toothless, ·2 in. in diam. when dry. *Petals* obtuse in bud. *Fruit* unknown. Cogn. in DC. Mon. Phan. VII, 1139.

Malacca; *Maingay* (Herb. prop.) 1422. Perak; *King's Collector* 4726.

An arboreal species with large flowers and thick branches, allied to *M. amplexicaule* but well distinct.

10. Memecylon Kurzii, King. A glabrous shrub; young branches terete, swollen under the nodes, the bark pale when dry. *Leaves* thinly coriaceous, sub-sessile, ovate-oblong, shortly acuminate, slightly narrowed to the rounded base; main nerves 15–20 pairs, rather straight, interarching ·25 in. from the margin, faint; length 8·5–10 in.; breadth 3·25–4·5 in.; petiole about ·1 in. long, stout. *Flowers* large, on slender bi-bracteolate pedicels ·4 in. long; the cymes 3- or 4-flowered, from the axils of fallen leaves, solitary or several together; peduncle short (only ·15 in. long). *Calyx-tube* campanulate, ·2 in. long; the mouth ·2 in. wide, wavy and with 4 broad teeth. *Fruit* ellipsoid, somewhat curved, ·75 in. in length (including the persistent limb of the calyx) and ·4 in. in diam. *M. subtrinervium*, Miq., var. *grandiflora*, Kurz in Journ. As. Soc. Beng. 1876, pt. II, 131; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 565; Cogn. in DC. Mon. Phan. VII, 1143.

Nicobar Islands; *Kurz*, *King's Collector* 509.

The leaves of this when dry are pale-brown on the upper and pale-olivaceous on the lower surface. They are different in shape from those of *M. subtrinervium*, Miq., of which Kurz makes this a variety. The flowers of the latter are moreover small and in slender pedunculate cymes.

11. Memecylon heteropleurum, Blume, Mus. Bot. Lugd. Bat. I, 362. A tree, 30 and 40 feet high; young branches rather slender, terete, the bark pale-brown or cinereous when dry. *Leaves* thinly coriaceous, broadly oblong-lanceolate or elliptic-oblong, shortly and rather bluntly acuminate, the base rounded or narrowed, not cordate, shortly petiolate, pale-brown with sometimes a touch of green on both surfaces when dry; main nerves 18–20 pairs, straight, interaching close to the margin, thin but very distinct on the lower surface when dry; length 5–7 in. rarely 10 in.; breadth 2–3·5 in.; petiole only ·1 in. *Flowers* pointed in bud, in dense cymes from the axils of the leaves or from those of the old leaves; the peduncle ·25 in. long; pedicels shorter, bi-bracteolate. *Calyx-tube* widely cupular, narrowed to the base, truncate, ·1–·15 in. in diam. when dry. *Fruit* globular, ·5 in. in diam. Miq. Fl. Ind. Bat. I, pt. I, 579; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 557; Cogn. in DC. Mon. Phan. VII, 1140.

Malacca; *Griffith* 2337 (Kew Distrib.); *Maingay* (K.D.) 816. Penang; *Curtis* 814. Singapore and Selangore; *Ridley*. Perak; *King's Collector*, *Wray*, *Scortechini*: many Nos.; common. Distrib. Sumatra and Borneo.

Var. *olivacea*, King. Leaves rounded at the base, large, 10–14 in. long and 3·5–4·25 in. broad, with a strong olivaceous tint when dry: fruit not seen.

Perak; *King's Collector* 500, 2778, 10872; *Wray* 1310.

This variety differs (as far as it is represented by dried specimens) from typical *M. heteropleurum*, Bl., only in the size of its leaves and their colour when dried; fruit of it is unknown, the flowers and shape of leaves are exactly those of the type.

12. Memecylon costatum, Miq. in Verh. Ned. Inst. 1850, p. 29. A tree, 30–60 feet high; young branches terete, but with 4 short wings below the nodes. *Leaves* thinly coriaceous (drying pale-brown with a tinge of yellowish-green), oblong- or oblong-lanceolate, sometimes oblong-ovate, shortly acuminate, the base rounded or slightly narrowed, not cordate, penni-nerved; the main nerves 12–14 pairs, stout, curved, anastomosing at ·25 in. from the margin with a bold lateral nerve; length 4·5–7·5 in.; breadth 1·75–3 in.; petiole very short, stout. *Flowers* crowded in axillary glomeruli, 1 in. or less in diameter; their pedicels short (·1–·05 in.), the bracteoles minute, triangular. *Calyx* cup-shaped, truncate, slightly narrowed at the base. *Petals* ·2 in. in diam. *Fruit* globose, ·35 in. in diam. Miq. Fl. Ind. Bat. I, pt. I, 573; Triana in Linn. Trans. XXVIII, 157; Blume, Mus. Bot. I, 360; C. B. Clarke in Hook fil. Fl. Br. Ind. II, 558; Cogn. in DC. Mon. Phan. VIII, 1136. *M. grande*, Bl. Bijdr. 1095 (not of Retz.).

Perak; *King's Collector* 10785. Distrib.; Java, Sumatra (*Forbes* 1442).

13. MEMECYLON AMPLEXICAULE, Roxb. Fl. Ind. II, 260. A shrub, 8–12 feet high; branches rather slender, terete between, but 4-angled and sometimes 4-winged below the nodes. *Leaves* (tinged with greenish-yellow when dry) sessile or nearly so, often semi-amplexicaule, ovate-oblong or ovate-lanceolate, sub-acute or shortly and bluntly acuminate, broadest a little above the cordate base, penni-nerved; the main nerves 9–12 pairs, not prominent, interaching inside the margin; length 3·5–6 in.; breadth 1–2·5 in. *Flowers* ·2 in. long, crowded in dense, axillary glomeruli 1 in. or less in diameter; their pedicels very short (lengthened to ·25 in. in fruit) and with minute bracteoles. *Calyx* campanulate, truncate, much narrowed to the base. *Petals* sub-rotund, ·2 in. in diam. *Fruit* globose, ·3 in. in diam. Wight Ic. 279. Naud. in Ann. Sc. Nat. Ser. 3, XVIII, 277; Miq. Fl. Ind. Bat. I, pt. I, 580; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 559 (in part); Cogn. in DC. Mon. Phan. VII, 1139 (in part). *M. depressum*, Benth. in Wall. Cat. 4101 (in part); Triana in Linn. Trans. XXVIII, 158 (in part). *M. cordatum*, Wall. Cat. 4100 (in part). *M. coerulum*, Triana in Linn. Trans. XXVIII, 158 (in part).

In all the Provinces except the Andaman and Nicobar Islands; common.

The petals of this are white tinged with pink. The plant described by Roxburgh under the name *M. amplexicaule* is a Malayan one, as he distintly states. The species from the South of India which has, in most of the synonyms above quoted, been treated as identical with this is, in my opinion, quite distinct. It has smaller and proportionately broader leaves, and the flowers, which are smaller and more numerous, are in fascicles from the axils of fallen leaves. This is allied to *M. costatum*, and like it, this has the stems often 4-winged below the nodes; the leaves are also sessile or nearly so, but they differ from those of *M. costatum* in invariably being cordate at the base.

14. MEMECYLON MICROSTOMUM, Clarke in Hook. fil. Fl. Br. Ind. II, 557. A tree, 40–70 feet high; branches terete, rather slender, dark greyish-brown when dry. *Leaves* very coriaceous, sessile and almost amplexicaul, oblong or narrowly elliptic, sub-acute or obtuse, the base rounded and slightly cordate, very opaque, the nerves very indistinct; length 3·25–4·5 in.; breadth 1·3–2 in. *Flowers* numerous, small, less than ·1 in long (excluding the exserted stamens), crowded in dense axillary glomeruli, pedicels filiform. *Calyx-tube* infundibuliform, constricted in its lower third, the mouth wide truncate. *Petals* pale yellowish-green. *Fruit* large (·6 in. in diam.), globular, the persistent calyx-limb small. Cogn. in DC. Mon. Phan. VII, 1147.

MALACCA; *Maingay* (Kew Distrib.) 821; PERAK; *Wray* 1137; *King's Collector* 10588. SINGAPORE; *Ridley* 2033. PENANG; *Curtis* 766.

The leaves of this, when dry, are olivaceous on the upper and pale-brown on the lower surface. The species resembles *M. amplexicaule* but differs notably in its large globular fruit.

15. Memecylon coeruleum, Jack, in Mal. Misc. I, 26. A shrub, 5–15 feet high; branchlets often 4-angled near the apices, otherwise terete, slender, the bark pale-brown when dry. *Leaves* sessile, coriaceous, opaque, oblong or ovate-oblong, obtuse or sub-acute, broadest a little above the rounded, cordate base, the midrib distinct but the main nerves faint and the reticulations obsolete; length 2·5–4·75 in.; breadth 1–2·5 in. *Flowers* rather numerous, in dense, axillary, condensed glomerulate cymes, the peduncle ·25 in. long, the pedicels shorter than the flowers, each with two broad, acute bracteoles. *Calyx-tube* short, widely campanulate, narrowed to the base, the mouth wide truncate. *Petals* conical in bud. *Fruit* narrowly ellipsoid, ·4 in. long and ·25 in. in diam. (including the deep, persistent calyx-limb). Miq. Fl. Ind. Bat. I, pt. I, 580; Triana in Linn. Trans. XXVIII, 158 (excl. syn. *M. amplexicaule*, Roxb.); Kurz, For. Flora B. Burma I, 511; C. B. Clarke in Hook. fil. Fl. Br. Ind. I, 559; Cogn. in DC. Mon. Phan. VII, 1163. *M. grande*, Smith in Rees' Cyc. XXIII (not of Retz). *M. cordatum*, Wall. Cat. 4100 (partly); Griff. Not. IV, 673. *M. manillanum*, Naud. in Ann. Sc. Nat., Ser. 3, XVIII, 276; Miq. l.c. 576. *M. lutescens*, Presl. Epim. Bot. 208 (not of Naud.).

In all the provinces; not uncommon. Distrib. Philippines.

16. Memecylon campanulatum, Clarke in Hook. fil. Fl. Br. Ind. II, 563. Young branches rather slender, terete, their bark pale-brown. *Leaves* coriaceous, elliptic, sometimes with a short blunt apical point, the base always much and abruptly narrowed, nerves invisible; length 3–4·5 in.; breadth 1·25–2·2 in.; petiole ·1–·15 in. *Flowers* on slender pedicels, ·1–·15 in. long, bracteolate at the base and crowded in dense fascicles in the axils of the leaves or of the fallen leaves, the buds of the petals shortly conical. *Calyx-tube* campanulate, blunt at the base and somewhat contracted below the wide truncate limb. *Fruit* unknown. Cogn. in DC. Mon. Phan. VII, 1162.

Malacca; *Griffith* (Kew Distrib. 2325).

In its leaves this much resembles *M. oleafolium*, Bl., but the flowers of that species are in lax, few-flowered, pedunculate umbels, whereas the flowers of this are in dense, epedunculate fascicles.

17. Memecylon minutiflorum, Miq. Fl. Ind. Bat. Suppl., 323. A tree, 30–70 feet high; young branches slender, with a broad, angularly margined groove on each side; the bark pale, smooth. *Leaves* thinly coriaceous, drying yellowish-green beneath, narrowly elliptic, cordate-acuminate, the base much narrowed; main nerves very indistinct.

Inflorescence twice as long as the petioles, many-flowered; the peduncles often two or three from the same axil, each bearing several 2–4-flowered umbels; pedicels stout, bracteolate at the base. *Calyx-tube* cup-shaped, not tapered to the base, the mouth expanded, truncate and ·05 in. wide, glandular-hairy when young like the bluntly conical petal-bud and the pedicels. *Fruit* crowned by the minute calyx-limb, depressed globular, smooth, ·35 in. in diam. and ·3 in. deep. Cogn. in DC. Mon. Phan. VII, 1169. *M. acuminatum*, Sm., VAR. *flavescens*, Clarke in Hook. fil. Fl. Br. Ind. II, 562; Cogn. in DC. Mon. Phan. VII, 1152.

MALACCA; *Griffith* (Kew Distrib.) 2325/2. PENANG; *Curtis* 815. PERAK; *King's Collector* 5027, 6105, 6265, 8724. DISTRIB. Sumatra.

Triana considers this a distinct species and I think he is right. *Fruit* however is wanting to complete our knowledge of the form. The Perak specimens agree perfectly with the type sheet named *M. minutiflorum*, Miq., in Herb. Calcutta. The species is not, as was suggested by Kurz, identical with *M. lilacinum*, Zoll. and Moritzi.

18. MEMECYLON MYRSINOIDES, Blume, Mus. Bot. I, 356. A tree, 30–40 feet high (rarely a shrub); young branches terete, slender, with pale-grey bark. *Leaves* thinly coriaceous, drying brown (palest on the lower surface), narrowly elliptic or ovate-lanceolate, the apex very acuminate, much narrowed to the cuneate base; main nerves invisible on both surfaces; length 1·5–2·5 in.; breadth ·9–1·25 in.; petiole ·15–·25 in. *Flowers* numerous, in very short-peduncled cymes, densely clustered together in the same axil; pedicels about the length of the calyx, bracteolate at the base. *Calyx-tube* campanulate, much narrowed to the base, the mouth less than ·05 in. wide, with 4 long (for the genus) acute teeth; *petals* in bud forming a long narrow cone, acuminate. *Fruit* globular, the size of a grain of black pepper. Miq. Fl. Ind. Bat. I, pt. I, 577; Triana in Linn. Trans. XXVIII, 158 (excl. syn.); Cogn. in DC. Mon. Phan. VII, 1160; excl. syn. *M. lilacinum*. *M. capitellatum*, Blume, Bijdr. 1091 (not of Linn.).

PENANG; *Curtis* 2219. JOHORE; *Ridley* 2026. PERAK; *Wray* 2258; *King's Collector* 1851, 3517, 5923, 8828. DISTRIB.; Sumatra; *Forbes* 2953; Java; Bangka.

VAR. *lilacina*, King. Young branches with two deep, sharply-margined grooves; leaves broadly elliptic, yellowish on the under surface when dry, cymes not crowded (only two in an axil). *M. lilacinum*, Zoll. & Mor. Syst. Verzeich., 9; Naud. in Ann. Sc. Nat. Ser. 3, XVIII, 281; Miq. Fl. Ind. Bat. I, pt. I, 575.

PENANG; *King's Collector* 1457; *Curtis* 100. SINGAPORE; *Ridley* 6218. PERAK; *King's Collector* 10442. DISTRIB.; Java, *Zollinger* 178.

19. Memecylon laevigatum, Blume, Mus. Bot. Lugd. Bat. I, 358. A small tree; young branches very slender, terete, the bark pale. *Leaves* thinly coriaceous, broadly ovate or elliptic, more or less rostrate-acuminate, the base cuneate; main nerves obscure; length 2–2·5 in.; breadth 1–1·75 in., petiole ·1–·15 in., opaque, when dry dull dark-brown, the lower surface slightly paler than the upper. *Cymes* mostly from the nodes of fallen leaves, small, few-flowered, the peduncle very short (·1 in. long), pedicels also very short. *Flowers* small (less than ·1 in. long), their buds pointed; *calyx-tube* campanulate, much tapered to the base, the mouth with 4 acute, small teeth. *Fruit* globular, ·3 in. in diam., smooth. Miq. Fl. Ind. Bat. I, pt. I, 576; Triana in Linn. Trans. XXVIII, 157; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 561 (excl. vars.); Kurz, For. Flora. I, 513; Cogn. in DC. Mon. Phan. VII, 1159. *M. Myrilli*, Blume, Mus. Bot., 357; Miq. l.c. 578. *M. pachyderma*, Wall. Cat. 4104. *M. Vosmaerianum*, Scheff. in Flora, 1870, 249.

Malacca; *Ridley* 1767. Singapore; *Ridley* 1815, 1906, 2026, 4805. Perak; *Scortechini* 81; *Wray* 2091; *King's Collector* 3768. Selangore; *Ridley* 2024. Distrib.; Burma, *Helfer* 2328; *Wallich* 4104; Bangka, Java, Borneo.

20. Memecylon cinereum, King, n. sp. A shrub; young branches rather slender, terete, sulcate on two sides, the bark dark-cinereous when dry. *Leaves* coriaceous, drying very dark cinereous-brown on the upper surface, somewhat paler on the lower, lanceolate or ovate-lanceolate, much acuminate, the base rounded but more often cuneate; main nerves 8–10 pairs, invisible on both surfaces or nearly so, length 2·8–5·5 in.; breadth 1–2·2 in.; petiole ·15–·3 in. *Peduncles* axillary or from the leafless nodes, not much longer than the petioles, glomerulate, many-flowered; pedicels short, stout, with small acicular bracteoles at the base. *Calyx-tube* cupular, with a rounded base; the mouth expanded, ·1 in. wide, undulate and with 4 acute, triangular teeth. *Fruit* globular, the persistent calyx-limb small, ·25 in. in diam., smooth.

Perak; *Scortechini* 394, 2035; *King's Collector* 3143, 10758.

21. Memecylon oleaefolium, Blume, Mus. Bot. I, 359. A tree, 30–60 feet high; young branches rather slender, terete, smooth, the bark very pale. *Leaves* coriaceous, elliptic-oblong or elliptic, the apex obtusely acuminate, the base much narrowed, when dry of a pale olivaceous-brown colour on both surfaces, the upper the darker; main nerves 8–10 pairs, obscure; length 2·5–4·75 in.; breadth 1–2·25 in.; petioles ·15 to ·3 in. *Peduncles* 1–3 in one leaf-axil, several times longer than the petiole (elongating in fruit), bearing at the apex

numerous, crowded, 2–3-flowered umbellules with a semi-circular bract at the bases of their short, stout, 4-angled peduncles. *Flowers* with conical buds, less than ·1 in. in diam., on slender pedicels longer than themselves, bracteolate at their bases. *Calyx* hemispheric; the mouth truncate, entire. *Fruit* ovoid-elliptic, crowned by the short calyx-limb, ·4 long and ·25 in. in diam. Miq. Fl. Ind. Bat. I, pt. I, 579 (excl. syn.); Cogn. in DC. Mon. Phan. VII, 1150. *M. Horsfieldii*, Miq. Fl. Ind. Bat. I, pt. I, 572. *M. grande*, Retz, var. *Horsfieldii*, Clarke in Hook. fil. Fl. Br. Ind. II, 558; Cogn. in DC. Mon. Phan. VII, 1153 (excl. syn. *M. celastrinum*, Kurz from both). *M. lampongum*, Miq. Fl. Ind. Bat. Suppl. 321.

Malacca; *Maingay* (Kew Distrib.) 811. Singapore; *Ridley* 6414. Perak; *Scortechini* 2069; *King's Collector* 426, 5187, 4420, 4439, 8571. Distrib. Bangka; *Horsfield;* Sumatra; *Forbes* 3213.

This has been treated by Messrs. Clarke and Cogniaux as a variety of *M. grande* of Retz, a species originally described by its author from specimens sent to him by Koenig, who collected in Southern India. Retz's description is very short and, as Mr. Clarke points out, would suit several species. The species of *Memecylon* have not, as a rule, a wide distribution, and very few indeed of them are common to S. India or Ceylon and to the Malay Peninsula. I think it, therefore, in the absence of his type specimen, advisable to consider Retz's name as properly belonging to the Ceylon plant represented by Thwaites's C.P. 3442. Both Messrs. Clarke and Cogniaux treat as belonging to typical *M. grande*, Retz, the Singapore plant issued by Wallich as No. 4472 of his Catalogue under the name *M. laxiflorum*. This plant is now represented only by fruiting specimens which do not, in my opinion agree with any other *Memecylon* in Herb. Kew. The inflorescence in Wallich's specimens is 2·5 in. long, pedunculate, and laxly compound-umbellate. When flowers shall be forthcoming it will probably be found necessary to let the species *M. laxiflorum* stand good.

Thwaites's C.P. which I assume, in the absence of a type specimen, to be equal to the type of *M. grande*, Retz, does not in my opinion resemble the four forms which the two distinguished botanists just mentioned agree in treating as varieties of it, sufficiently closely to warrant such treatment of the latter. I would venture to dispose of them as follows:—

Var. Horsfieldii = M. oleaefolium, *Bl.* Var. khasiana = M. celastrinum, *Kurz.*
Var. pubescens = M. pubescens, *King.* Var. merguica = M. merguica, *King.*

M. Cogniaux has inadvertently described the fruit of *M. oleaefolium* as globose, whereas in his original description of it Blume writes "*fructibus ellipsoideis.*"

22. Memecylon pauciflorum, Blume, Mus. Bot. I, 356. A small tree; young branches 4-angled, slender, pale-brown. *Leaves* coriaceous, rhomboid or elliptic-rhomboid, drying brown, the lower surface paler, the apex blunt and often retuse, the base acute or subacute; nerves 6 or 7 pairs, invisible or very faint; length 1–1·5 in.; breadth ·35–1 in.; petiole under ·1 in. *Cymes* umbellate, axillary, on slender peduncles ·1–·2 in. long; flowers 7–10, small, on slender pedicels bracteolate at the base

and about ·15 in. long. *Calyx-tube* shortly campanulate, or saucer-shaped, with a large, wide, sharply and minutely 4-toothed mouth. *Petals* acuminate. *Stamens* and style much exserted. *Fruit* depressed-globular, smooth, crowned by the toothed calyx, ·2 in. in diam. Miq. Fl. Ind. Bat. I, pt. I, 578; Kurz, For. Flora Burma I, 514; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 555; Cogn. in DC. Mon. Phan. VII, 1169. *M. capitellatum*, Spanoghe in Linnaea, XV, 203 (not of Linn.). *M. umbellatum*, Benth. Fl. Austral III, 293 (non Burm.). *M. australe*, Muell. ex Triana in Linn. Trans. XXVIII, 159.

Andaman Islands; very common. Distrib. Burma (*Helfer* 2332); Chittagong; Australia; Timor.

The Penang specimens have narrower, less rhomboid leaves than those from the Andamans.

23. Memecylon elegans, Kurz in Journ. As. Soc. Beng. 1872, pt. II, 307. A glabrous shrub; young branches slender, boldly 4-angled, sometimes winged, the bark pale. *Leaves* coriaceous, pale yellowish, the upper surface tinged with green when dry, oblong to elliptic, much acuminate, the base very cuneate; main nerves invisible or very indistinct; length 3·5–5·5 in.; breadth 1·4–2 in.; petiole ·15–·3. *Flowers* ·15 in. long, their pedicels longer, (·2 in.), slender, angled. *Cymes* axillary, several together, pedunculate, simply or trichotomously umbellulate; peduncles ·3–·75 in. long, 4-angled. *Calyx-tube* somewhat large for the genus, cup-shaped, narrowed to the base, ·1 in. wide at the undulate, obscurely 4-lobed mouth. *Petals* blue, broadly ovate, acuminate. *Fruit* globular, smooth, ·5 in. in diam. Kurz, For. Flor. Burma I, 514; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 554; Cogn. in DC. Mon. Phan. VII, 1138.

Andaman Islands; very common.

Var. *minor*, King. *Cymes* usually solitary, the pedicel slender, short; fruit only ·2 in. in diam. (? ripe); leaves 2–3 in. long.

Andamans; *King's Collectors.*

Smaller than the typical form in all its parts. The flower buds also differ somewhat from those of the typical form.

24. Memecylon acuminatum, Smith in Rees Cyclop. XXIII, 4. A tree, 30–50 feet high; young branches slender, terete, the bark brown, smooth. *Leaves* thinly coriaceous, drying pale olivaceous-brown, the surfaces concolourous, ovate to ovate-lanceolate, caudate-acuminate, the base cuneate; main nerves invisible; length 1·5–2·25 in.; breadth ·8–1·4 in.; petiole ·1–·15 in. *Cymes* solitary or in pairs, axillary, umbellate, on peduncles several times longer than the petioles. *Flowers* 6–8 in a compound umbel; pedicels bracteolate at the base, slender,

twice as long as the flowers. *Calyx-tube* cup-shaped, the fundus broad, slightly constricted below the thick, short, undulate, broadly 4-toothed limb. *Petals* conical in bud. *Fruit* globular, somewhat depressed, smooth, crowned by the narrow calyx-limb, ·25 in. in diam. Triana in Trans. Linn. Soc. XXVIII, 158; DC. Prodr. III, 6; Clarke in Hook. fil. Fl. Br. Ind. II, 562; Cogn. in DC. Mon. Phan. VII, 1152 (excl. VAR. *flavescens*).

MALACCA; *Griffith* (Kew Distrib.) 2325; *Maingay* 810; *Derry* 1041; *Ridley* 3297, 3298, 4574. JOHORE; *Ridley* 4656. PERAK; *King's Collector* 3458, 6754.

25. MEMECYLON GARCINIOIDES, Blume, Mus. Bot. I, 358 (excl. VAR. B). A tree, 20–40 feet high; young branches terete, slender, pale-brown. *Leaves* thinly coriaceous, oblong-ovate or elliptic, abruptly and rather obtusely acuminate, the base cuneate, drying pale-brown tinged with olive, the under surface the palest; main nerves invisible; length 3–5·5 in., breadth 1·2–2 in.; petiole ·05–·1 in. *Cymes* axillary and in the axils of old leaves, umbellate, many-flowered, on short peduncles (·2 in. long, longer in fruit); pedicels slender, bracteolate at the base, ·1–·15 in. long. Flower-buds acute. *Calyx-tube* small and cup-shaped, the mouth very wide (nearly ·1 in.), truncate, but with four minute, acute teeth. *Fruit* globular, smooth, pale when dry, ·2 in. in diam. Cogn. in DC. Mon. Phan. VII, 1152.

MALACCA; *Derry* 1240. *Maingay* (Kew Distrib.) 817. PERAK; *Scortechini* 2033; *Wray* 2961, 3203; *King's Collector* 1984, 2938, 7123, 10034; SINGAPORE; *Ridley* 8118. SELANGORE; *Ridley* 7333. DISTRIB. Sumatra, *Blume*, *Forbes* 2970, 3108; Borneo, *Beccari* 536.

26. MEMECYLON ANDAMANICUM, King, n. sp. A shrub; young branches slender with faint grooves below the nodes, the bark pale-brown. *Leaves* chartaceous, brown on the upper and greenish-yellow on the lower surface when dry, oblong-lanceolate, gradually and bluntly acuminate, the base cuneate; main nerves 10–12 pairs, interarching near the edge, sub-horizontal; length 2·25–3 in.; breadth ·75–1 in.; petiole ·25–·3 in. *Peduncles* unequal, ·2–·4 in. long, in pairs in the axils of leaves or of fallen leaves, bearing at their apices several 3–5-flowered umbels, bracteolate at the divisions, flower-pedicels as long as the calyx, minutely bracteolate at the base. *Calyx-tube* campanulate, tapered below, the mouth truncate, nearly ·2 in. wide. Bud of petals conical. *Fruit* depressed-globular, crowned by the small calyx-limb, yellowish, ·2 in. in diam.

ANDAMAN ISLANDS; *King's Collectors*, 357, 452. NICOBAR ISLANDS.

A species with leaves somewhat like those of *M. garcinioides*, Bl., but narrower. In its inflorescence it resembles *M. acuminatum*, Sm., but the peduncles are longer

than in that species. The inflorescence also resembles that of *M. intermedium*, Bl., but when young it is covered with a yellow waxy coat; the pedicels and peduncles are moreover much shorter than in *M. intermedium*. The leaves resemble those of the latter species in shape but are of a thinner texture so that the nerves are visible though faint.

27. MEMECYLON INTERMEDIUM, Blume, Mus. Bot. I, 358. A tree, 20–40 feet high; young branches slender, terete, pale cinereous. *Leaves* thinly coriaceous, broadly ovate, shortly and bluntly acuminate, the base cuneate, greenish above and brown beneath when dry; main nerves invisible or nearly so; length 2·75–3·5 in.; breadth 1·25–2 in.; petiole ·25–·35 in. *Cymes* large, crowded, in the axils of leaves or of fallen leaves, usually in pairs, on peduncles several times longer than the petioles, compoundly umbellate; pedicels slender, bracteolate at the base, ·1 in. long. *Calyx-tube* cup-shaped, with a wide, truncate, edentate or minutely toothed limb. *Fruit* not seen (globose *fide* Cogniaux). Triana in Linn. Trans. XXVIII, 157; C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 561; Cogn. in DC. Mon. Phan. VII, 1158. *M. umbellatum*, Blume, Bijdr. 1094 (not of Burm.) Naud. in Ann. Sc. Nat. Ser. 3, XVIII, 273; Miq. Fl. Ind. Bat. I, pt. I, 575. *M. garcinioides*, Bl., VAR. *elongatum*, Blume, Mus. Bot. I, 358.

PERAK; *Scortechini* 1036. DISTRIB. Sumatra; Java.

This resembles *M. garcinioides*, Bl., very closely, but differs in inflorescence, the cymes of this being larger, on longer peduncles.

28. MEMECYLON EDULE, Roxb., Corom. Plants I, t. 82. A shrub or small tree; young branches terete, pale when dry. *Leaves* coriaceous, drying brown, the lower surface paler, both often with an olivaceous tinge, elliptic or ovate, the apex sub-acute or shortly and bluntly acuminate, the base usually cuneate but sometimes rounded; main nerves 5–8 pairs, very inconspicuous, ascending; length 2–4 in.; breadth ·85–2·25 in.; petiole ·1–·35 in. *Peduncles* several together, unequal in length, longer than the petioles, axillary, umbellately cymose, many-flowered; pedicels longer than the calyx. *Calyx-tube* cupular, narrowed to the base, the limb truncate, sometimes obscurely 4-toothed. *Fruit* globular, crowned by the small calyx-limb, ·25 in. in diam.

Only two of the numerous varieties of this species occur in our region. These are as follows:—

VAR. 1. *typica*. Leaves usually under 3 in. long, dull, tinged with yellow when dry, acute or obtuse. *M. edule*, Roxb. Fl. Ind. II, 260; DC. Prodr. III, 6; Wall. Cat. 4107; Dalz. & Gibs. Bomb. Fl. 93; Kurz, For. Fl. I, 512. *M. edule*, VAR. *a*, Thwaites Enum. 111. *M. umbellatum*, Burm. Fl. Zeyl. t. 31. *M. tinctorium*, Kœn. ex W. & A. Prodr. 319; Wight Ill. t. 31. *M. globiferum*, Wall. Cat. 4108. *M. pyrifolium*, Naud. in Ann. Sc. Nat. Ser. 3, XVIII, 277.

SINGAPORE ; *Ridley* 4084, 6054. MALACCA ; *Griffith* (Kew Distrib.) 2327; *Maingay* (K.D.) 812 ; *Derry* 1028. KEDAH ; *Ridley* 2627, *Curtis* 2627. DISTRIB. India, Ceylon.

VAR. 2. *ovata*, C. B. Clarke in Hook. fil. Fl. Br. Ind. II, 563. Leaves large, often 4–4·5 in. long, acute or acuminate at the apex, the base rounded or cuneate, shining when dry ; fruit black when ripe and somewhat succulent. *M. ovatum*, Sm. ex Kurz, For. Fl. I, 512. *M. edule*, VAR. γ, Thwaites Enum. 110. *M. umbellatum*, Hb. Heyne in Wall. Cat. 4109. *M. tinctorium*, VAR. β, W. & A. Prodr. 319. *M. prasinum*, Naud. in Ann. Sc. Nat. Ser. 3, XVIII, 275. *M. grande*, Wall. Cat. 4103 partly. *M. lucidum* and *M. pyrifolium*, Presl. Epim. Bot. 209, 210.

ANDAMAN ISLANDS ; not common. NARCONDAM and GREAT COCO ISLANDS ; *Prain*. PERAK ; *King's Collector* 4175 ; *Scortechini* 947. PENANG ; *Curtis* 723. SINGAPORE ; *Ridley* 6532. DISTRIB. India, Malayan Archipelago.

DOUBTFUL SPECIES.

M. amabile, Bedd. VAR. *malaccensis*, Clarke in Fl. Br. Ind. II, 555. This is founded by its author on the very imperfect material afforded by Maingay's specimens (Kew Distrib. 819).

M. laxiflorum, Wall. Cat. ; see note under *M. oleaefolium*, Blume.

V.—*Materials for a Flora of the Malayan Peninsula.*—*By* Sir George King, K.C.I.E., LL.D., F.R.S., &c., *late Superintendent of the Royal Botanic Garden, Calcutta.*

[Received April 2nd; Read June 5th, 1901.]

No. 12.

The present contribution to these *Materials* is occupied exclusively by an account of the Natural Order *Myrtaceæ*. In the sequence followed in *Hooker's Flora of British India*, which has been adopted in these papers, this family ought to have immediately preceded *Melastomaceæ*. But, for reasons which are of no importance to any one besides the author, the account of the latter order was prepared first and was published in the eleventh of these papers. In the present paper 122 species, belonging to 11 genera, are described. Six of these genera are represented by only a single species; two of them by 2 species; one by 5, one by 11, and the remaining one (*Eugenia*) by no fewer than 96 species. The latter genus is a very perplexing one, from the fact that the species resemble each other so closely. It is impossible to limit the genus by really good well-marked characters, and it is equally impossible to divide it into sub-genera by characters which do not break down. *Eugenia* seems to be essentially a genus in the evolution of which an extraordinary number of the successive forms have been preserved. I have adhered to the arrangement of the species into the groups *Jambosa* and *Syzygium*, although there are many species which might be referred to either. Nobody can be more dissatisfied than I myself am with the *clavis* of the species which I have prepared. In fact, while dealing with this genus and with its literature, the belief has been forced upon me that verbal descriptions are of very little use in identifying the species, and that the only safe way of doing so is by comparison with authentically named Herbarium specimens.

Order XLVI. MYRTACEÆ.

Trees or shrubs, rarely herbs. *Leaves* opposite, seldom alternate or whorled, petioled, simple, entire, rarely denticulate or crenate, 3-nerved or pinnately-nerved and usually with an intramarginal nerve, generally coriaceous, and dotted with pellucid glands. *Stipules* if present small and deciduous. *Flowers* regular, very rarely irregular, hermaphrodite, or polygamous by abortion, axillary, solitary or in spikes cymes corymbs or heads, naked or with an involucre, often with 2 bracts at the base, white, pink, purple, or yellow, never blue. *Calyx* superior or $\frac{1}{2}$-superior, limb 4–5-many-fid or -partite, persistent or deciduous,

valvate or imbricate, sometimes entire or closed in bud. *Petals* inserted on a disk surrounding the cavity of the calyx, equal in number to the calyx-lobes and alternate with them, rarely 0. *Disc* lining the calyx-tube, staminiferous at the margin. *Stamens* usually numerous, inserted with the petals in several rows, rarely definite and alternate with the petals; filaments free or more or less coherent at the base or in bundles opposite the petals; anthers small roundish, with parallel cells bursting longitudinally. *Ovary* inferior or $\frac{1}{2}$-inferior, crowned by a fleshy disk, 1-celled with 1 or more ovules, or more usually 2–many-celled with many ovules; placentation axile (parietal in *Rhodamnia*); style terminal rarely lateral, smooth or bearded at the summit; stigma undivided. *Fruit* usually crowned by the calyx-limb, either 1-celled and 1-seeded by abortion, or 2–many-celled with loculicidal dehiscence; or baccate and indehiscent with the cells many-seeded or 1-seeded by arrest. *Seeds* angular cylindric or compressed; testa hard or membranous, sometimes winged; albumen 0; embryo straight curved or spirally twisted, cotyledons usually short and obtuse sometimes combined into a mass with the radicle, very rarely leafy, radicle often thick. DISTRIB.—Tropical and sub-tropical regions of both hemispheres; species upwards of 2800.

TRIBE I. *Leptospermeæ.* Fruit capsular; leaves opposite or alternate.

Leaves narrow.

Flowers few or solitary in the leaf-axils.

Stamens 10 or fewer, free, in a single series; leaves opposite ... ... 1. BÆCKEA.

Stamens numerous, free, in a single series; leaves alternate ... ... 2. LEPTOSPERMUM.

Flowers in heads or spikes; leaves usually alternate; stamens numerous, slightly combined into bundles opposite to and longer than the petals ... ... 3. MELALEUCA.

Leaves broad.

Flowers in axillary cymes; leaves alternate; stamens indefinite, united into 5 bundles opposite to and shorter than the petals ... ... 4. TRISTANIA.

TRIBE II. *Myrteæ.* Fruit a berry; leaves opposite, often gland-dotted.

Ovary 1-celled with 2 parietal multi-ovulate placentas: flowers small; leaves 3-nerved from the base ... 5. RHODAMNIA.

Ovary 1–3-celled with 2 rows of ovules in each cell separated by spurious partitions; flowers rather large; leaves 3- to 5-nerved at the base, seeds numerous ... ... 6. RHODOMYRTUS.

Ovary 5- (sometimes 4-) celled, with several ovules in each cell, often with spurious partitions; seeds few; embryo long and narrow with small cotyledons: flowers small and numerous; leaves not 3-nerved ... ... 7. DECASPERMUM.

Ovary 2-3-celled with several ovules in each cell, without spurious partitions; embryo thick, fleshy; cotyledons large radicle short; seeds few; stamens numerous ... 8. EUGENIA.

Ovary 2-celled with numerous ovules in each cell; flowers small, few, in small axillary inflorescences. Stamens 8: otherwise as in *Eugenia* ... ... 9. PSEUDO-EUGENIA.

TRIBE III. *Lecythideæ*. Fruit hard and fibrous or fleshy, indehiscent; leaves alternate, not gland-dotted.

Stamens all antheriferous, staminodes none; embryo undivided; fruit angular, one-seeded ... ... 10. BARRINGTONIA.

Inner stamens shorter and without anthers; embryo involute; the cotyledons leafy, plicate: fruit ovoid, several-seeded ... ... 11. PLANCHONIA.

1. BÆCKEA, Linn.

Glabrous heath-like shrubs. *Leaves* opposite, narrow, pointed, entire, with many pellucid glands. *Flowers* 5-merous, rarely 4-merous, axillary, peduncled, with 2 minutely bracteolate. *Calyx-tube* widely campanulate; lobes 5, membranous, persistent. *Petals* 5, suborbicular. *Stamens* 10 or fewer, shorter than the petals. *Ovary* in the single Malay species $\frac{1}{2}$-inferior, 2-3-celled, with several ovules in each cell. *Capsule* bursting from above loculicidally. *Seeds* angular; embryo straight with short cotyledons.—DISTRIB. Species about 50, the greater number Australian, a few in New Caledonia, one only extending into India.

There are considerable differences in the stamens amongst the species referred by Messrs. Bentham and Hooker to this Linnæan genus. Some of the species have only 5 stamens, while others (like the solitary Indo-Malayan one) have 10 which however are not unfrequently reduced to 8. There are moreover differences in the shape of the anthers and filaments. The ovaries also in some have two and in others three cells. On these and other characters more than a dozen genera were founded by Schauer and others, but these have been advantageously reduced to *Bæckea*.

BÆCKEA FRUTESCENS, Linn. Sp. Pl. 358. A slender shrub with thin wiry branches. *Leaves* linear, pointed, ·25 to ·5 in. long and ·05 in. broad. *Flowers* axillary, ·08 in. in diam., usually solitary, in short peduncles. *Calyx* with 5 rounded persistent lobes. *Stamens* 10 (or sometimes only 8). Ovary half-inferior. DC. Prod. III, 229: Sur. in Trans. Linn. Soc. III, 260; Bot. Mag. t. 2802; Blume Mus. Bot. I, 69; Miq. Fl. Ind. Bat. Vol. I. Pt. 1, 406; Suppl. 308; Benth. Fl. Hong-Kong, 118: Duthie in Hook. fil. Fl. Br. Ind. II, 463. *B. Cumingiana*, Schauer in Walp. Rep. II, 920. *B. chinensis*, Gærtn. Fruct. I, 157, t. 31. *B. sumatrana*, Bl. Mus. Bot. I, 69.

In all the provinces except the Andaman and Nicobar Islands. DISTRIB.—Malayan Archipelago.

2. Leptospermum, Forst.

Shrubs or small trees, glabrous or silky-pubescent. *Leaves* alternate, entire, rigid, with 1–3 nerves or nerveless. *Flowers* solitary and axillary, or 2–3 together at the ends of the branches, rarely peduncled, sometimes polygamous; bracts broad, scarious, often imbricate, the lower ones caducous. *Calyx-tube* broadly campanulate or turbinate, adnate to the ovary below, the free upper part broad; lobes 5. *Petals* 5, spreading. *Stamens* numerous, in a single series, not longer than the petals; anthers versatile, their parallel cells bursting longitudinally. *Ovary* inferior or ½-inferior, enclosed in the calyx-tube, 5- or more-celled, rarely 3- or 4-celled; style filiform, inserted in a deep depression of the ovary, sometimes short; stigma capitate or peltate. *Capsule* usually exceeding the calyx-tube, opening loculicidally from above. *Seeds* numerous, linear or winged, often sterile; embryo straight. Distrib.—Species upwards of 30, chiefly Australian, a few in New Zealand and New Caledonia.

NOTE.

As in *Bæckea* the species have been separated off into several genera which have been reduced by Messrs. Bentham and Hooker.

Leptospermum flavescens, Sm. in Trans. Linn. Soc. III, 262. A bush or small scraggy tree with thin, striate, 4-angled branches: the young parts glabrous or sericeous. *Leaves* coriaceous, narrowly oblong-lanceolate to oblanceolate, obtuse, often with a deciduous point, subsessile; when dry distinctly dotted beneath and obscurely 3-nerved, glabrous or silky on the midrib beneath and on the edges, from ·4 to 1 in. long and ·1 to ·3 in. broad. *Flowers* sessile or sub-sessile, about ·5 or ·6 in. in diam. (when dry). *Calyx-tube* glabrous or sericeous. *Capsule* much depressed, surrounded by the calyx-tube, glabrous or hairy, 5-ridged, pitted, opening by 5 valves, ·25 to ·30 in. in diam. (when dry). DC. Prod. III, 227; Hook. fil. Fl. Tasm. I, 139; Benth. Fl. Austral. III, 104.

This species is common and widely distributed in Australia and has several well-marked varieties of which two occur in our region.

var. *commune*, Benth. Fl. Austral. III, 104. Young branches leaves and calyx-tube glabrous or glabrescent. *Leaves* narrowly oblong or linear-lanceolate, ·1 to ·15 in. broad. *L. flavescens*, Bot. Mag. t. 2695. *L. amboinensis*, Blume Bijdr. 1100: Mus. Bot. Lugd. Bat. I, 68; DC. Prod. III, 229: Miq. Fl. Ind. Bat. I, Pt. 1, 404; Duthie in Hook. fil. Fl. Br. Ind. II, 464. *L. polygalifolium*, Salisb. Prod. 350; *L. Thea*, Willd. Spec. Pl. II, 949. *L. porophyllum*, Cav. Ic. IV, 17, t. 330, fig. 2. *Macklottia amboinensis*, Korth. in Ned. Kruidk. Arch. I, 196. *Myrtus amboinensis*, Rumph. Herb. Amb. II, 77, t. 18.

Malacca (on Mount Ophir); *Griffith* (K.D. 2339); *Lobb*, *Stolickza*, *Maingay* (K.D.) 713. Kedah, *Ridley* 5349. Distrib.—Bangka, Amboina, Moluccas, Borneo, Australia.

var. *javanica*. Young branches densely sericeous; *calyx-tube* glabrescent, occasionally very sericeous. *Leaves* obovate-lanceolate, broadly obtuse, with long silky hairs on the margins and on the midrib beneath. *Flowers* often crowded. *L. javanicum*, Blume Bijdr. 1100; Mus. Bot. Lugd. Bat. I, 68; DC. Prod. III, 229: Duthie in Hook. fil. Fl. Br. Ind. II, 464. *L. floribundum*, Jungh. Java I, 578; Nat. en Geneesk. Arch. Ned. Ind. II, 370; Miq. Fl. Ind. Bat. I, Pt. 1, 404. *Macklottia javanica*, Korth. Ned. Kruidk. Arch. 196.

Malacca: *Griffith*. Perak: *Wray* 330, 885, 3839: *Scortechini* 754: *King's Collector* 7426, 7435. Distrib.—Sumatra, Java, Celebes, Borneo. Burmah (a single specimen) at Moulmein; *Lobb*. This variety is much commoner in the Peninsula than the former.

3. Melaleuca, Linn.

Trees or shrubs. *Leaves* alternate, rarely opposite, entire, lanceolate or linear, flat or subterete, 1–3–many-nerved. *Flowers* in heads or spikes, each sessile in the axil of a floral leaf, 5-merous; bracts deciduous. *Calyx-tube* subglobose; lobes 5, imbricate or open, deciduous or persistent. *Petals* 5, spreading, deciduous. *Stamens* numerous, more or less united at their bases into 5 bundles opposite the petals; anthers versatile, the cells parallel and bursting longitudinally. *Ovary* inferior or half-inferior, enclosed in the tube of the calyx; style filiform, stigma small; ovules numerous. *Capsule* included in the calyx, dehiscing loculicidally by 3 valves. Perfect *seeds* cuneate: embryo straight, longer than the radicle. Distrib.—Species about 130, almost all Australian, but one scattered in Asia.

Melaleuca Leucadendron, Linn. Mant. 105. A tree often of considerable size; the bark pale, thick, peeling off in papery layers. Branches usually pendulous, slender. *Leaves* coriaceous, alternate, narrowly oblong-elliptic, oblique or falcate, acuminate acute or obtuse, narrowed below into a short petiole, with 3 to 5 or 7 vertical unastomosing nerves; when young adpressed-hairy, when old glabrous: length 1·5 to 5 in.; breadth ·2 to 1 in. *Spikes* 2 to 6 in. long; sometimes interrupted, solitary, at first terminal but subsequently surmounted by a leaf-axis, the rachis and calices glabrous or hairy: *calyx-tube* ovoid, the lobes orbicular. *Petals* ·1 to ·15 in. in diam. *Staminal* bundles under ·5 in. long. *Fruit* about ·2 in. in diam. Benth. Fl. Austral. III, 142: Kurz in Journ. As. Soc. Beng. XLVI, Pt. 2, 61; Fl. Br. Burm. I, 472; Duthie in Hook. fil. Fl. Br. Ind. II, 465.

MALACCA: *Singapore.* DISTRIB.—Malayan Archipelago, British India, Australia.

The following two varieties have been distinguished by Mr. Duthie in Hooker's Flora of British India.

VAR. *Leucadendron;* spikes glabrous. Linn. Mant. 105 and Suppl. 342; Lour. Fl. Cochinch. 468; Roxb. Fl. Ind. III, 397; DC. Prodr. III, 212; Wall. Cat. 3646; Blume Mus. Bot. I, 66; Miq. Fl. Ind. Bat. I, pt. 1, 401. *Myrtus Leucadendron*, Linn.—Rumph. Herb. Amb. II, 72, tt. 16, 17, f. 1.—Cultivated in India.

VAR. *minor;* spikes villous. *M. minor*, Sm. in Rees. Cycl. 23; DC. Prodr. III, 212; Wall. Cat. 3645; Blume Mus. Bot. I, 67; Miq. Fl. Ind. Bat. I, Pt. 1, 403. *M. Cajuputi*, Roxb. Fl. Ind. III, 394; W. & A. Prodr. 326; Miq. *l.c.* 403. *M. Leucadendron*, Lam. Encycl. 641. *M. viridiflora*, Gærtn. Fruct. I, 173, t. 35; DC. Prodr. *l.c.*; Wall. Cat. 3647. *M. saligna*, Blume Mus. Bot. I, 66. *M. Cumingiana* and *lancifolia*, Turcz. in Bull. Soc. Mosc. xx. 164. *M. saligna*, Gmel. Syst. 793.—Rumph. Herb. Amb. II, 76.—This appears to be the plant from which the Cajuput-oil of commerce is chiefly obtained.

4. TRISTANIA, R. Br.

Tall shrubs or trees. *Leaves* alternate or crowded at the summit of the branches, rarely opposite, coriaceous, glabrous. *Flowers* small, yellow or white, in pedunculate axillary cymes; bracts deciduous or 0. *Calyx-tube* turbinate-campanulate or open, attached below to the ovary; lobes 5, short, persistent. *Petals* 5, imbricate, spreading. *Stamens* numerous, shorter than the petals, usually united in 5 bundles and opposite to them; anthers versatile, cells parallel and opening longitudinally. *Ovary* inferior or $\frac{1}{2}$-superior, the apex flat or convex; 3-celled; ovules many in each cell, suspended or horizontal. *Capsule* loculicidally 3-valved. Perfect *seeds* few, linear, cuneate, or winged at the upper part; embryo straight, cotyledons broad, longer than the radicle. DISTRIB.—About 22 species inhabiting the Malay peninsula and islands, New Caledonia, and Australia.

Leaves sessile, sub-auriculate	1.	*T. subauriculata.*
Leaves narrowed into a short petiole.		
Cymes (with their peduncles) much shorter than the leaves.		
Leaves oblanceolate or obovate-oblong; capsules globular.		
Petals transversely oblong, entire, shortly clawed; capsules ·4 to ·5 in. in diam.	2.	*T. merguensis.*
Petals sub-rotund, subentire, hairy; capsules ·35 in. in diam.	3.	*T. Maingayi.*
Leaves obovate; capsule oblong, ·2 in. long; petals sub-rotund, their margins serrate	4.	*T. obovata.*
Cymes (with their peduncles) longer than the leaves ...	5.	*T. Whiteana.*

1. Tristania subauriculata, n. sp. King. A tree 10 to 40 feet high: the young branches pale (when dry) puberulous or glabrescent. *Leaves* very coriaceous, sessile, obovate-oblong, the apex broad, blunt, emarginate or slightly pointed, gradually narrowed to the slightly-auricled base: both surfaces glabrous, pale when dry, the upper shining, the lower paler, dull, obscurely glandular: main-nerves spreading, not prominent, ·2 in. apart, length 2·5 to 6 in.; breadth 1·5 to 2·5 in. *Cymes* axillary, few-flowered, much shorter than the leaves, dichotomous: the peduncles ·3 to ·8 in. long, compressed, clothed, especially above, with white silky hairs. *Flowers* ·25 in. across. *Calyx-tube* tubular-campanulate, densely pubescent below externally, the teeth broadly triangular, blunt, short. *Petals* rounded, entire, glabrous. *Stamens* in 5 groups of 10 each. *Ovary* depressed-globular, glabrous. *Capsule* sub-globular, glabrous, half-enveloped by the calyx, ·25 in. in diam. *Seeds* compressed, about 8 in each cell.

Perak: *King's Collector* 7047, 8253.

This is allied to *T. merguensis*, but has broader leaves of much thicker texture and sessile; shorter fewer-flowered cymes, and smaller flowers and fruit.

2. Tristania merguensis, Griff. in Journ. As. Soc. Beng. for 1854, p. 637. A tree. Young branches stout with pale bark when dry; the youngest puberulous. *Leaves* obovate-lanceolate, obtuse or obtusely acuminate, narrowed to the very short or almost obsolete petiole; main-nerves ascending, distinct, ·1 in. apart; both surfaces glabrous, the lower dull, paler and obscurely glandular, the upper shining; length 3·5 to 7 in.; breadth 1·15 to 2 in.; petiole ·1 to ·2 in. *Cymes* on angular peduncles ·5 to 1·5 in. long, slightly supra-axillary, shorter than the leaves, dichotomous, hoary-pubescent, especially towards the apex. *Flowers* densely crowded at the ends of the branchlets, ·25 in. in diam. *Calyx-tube* densely clothed with white pubescence on both surfaces, broadly cupular, tapered to the very short almost obsolete pedicel, the teeth broad, rounded. *Petals* small, transversely oblong, shortly clawed. *Ovary* pilose. *Capsule* sub-globular, large (·4 in. in diam.), glabrous, half-enveloped by the calyx; its valves broad, blunt. *Seeds* compressed, about 8 in each cell. Kurz, For. Fl. Burm. I, 473. "*Tristaniæ affinis*," Griff. Notul. 650: Ic. Pl. Asiat. t. 636, f. 3. *Melaleuca eugeniifolia*, Wall. Cat. 3648. *M. decurrens*, Wall. Cat. 3649.

Malacca: *Finlayson*, *Harvey*. Perak: *Wray* 2921, 4124; *Scortechini* 1021. Pahang: *Ridley* 1062: growing at elevations of several thousand feet. Distrib.—Burma, Borneo.

3. Tristania Maingayi, Duthie in Hook. fil. Fl. Br. Ind. II, 467. A tree: young branches with brown bark (when dry) and covered with deciduous white hairs. *Leaves* narrowly oblong-oblanceolate acute, much

narrowed to the short petiole; main-nerves spreading, less than ·1 in. apart, not conspicuous; lower surface dull and glandular, slightly paler than the shining upper: length 1·75 to 3·5 in.; breadth ·5 to 1·25 in.; petiole ·1 to ·2 in. *Cymes* on angular peduncles ·5 to 1·25 in. long, axillary, shorter than the leaves, dichotomous, hoary; the flowers few, crowded, ·3 in. in diam., on very short pedicels. *Calyx-tube* broadly cup-shaped, tapered to the base; the teeth shallow, broad, sub-acute. *Petals* small, sub-rotund, sub-entire, hairy outside. *Ovary* pubescent. *Capsule* large (·35 in. in diam.) sub-globular, glabrous, enclosed in the calyx except at the apex; its valves broad, blunt. *Seeds* winged, 9 or 10 in each cell.

PENANG: *Maingay* (K.D. 769); *Curtis*, 238, 438.

I keep up this species with much hesitation. It appears to me to be a form of *T. merguensis* with leaves and capsules smaller than usual.

4. TRISTANIA OBOVATA, R. Br. in Benn. and Horsf. Fl. Jav. 127, t. 27. A large shrub: the young branches reddish-brown, rusty puberulous. *Leaves* obovate, much contracted to the short petiole, the apex rounded or retuse; both surfaces glabrous, the lower glandular and paler: main-nerves spreading, about ·1 in. apart; length 1·5 to 2·5 in.; breadth ·6 to 1·2 in.; petiole ·2 to ·4 in. *Cymes* extra-axillary and terminal, few-flowered, puberulous or glabrous, much shorter than the leaves. *Flowers* ·15 in. long, on pedicels shorter than themselves, often in pairs. *Calyx-tube* turbinate; the teeth rounded, short. *Petals* sub-rotund with serrate margins. *Ovary* silky. *Capsule* ·2 in. long, oval, glabrous, much longer than the persistent calyx: its valves broad, blunt. Miq. Fl. Ind. Bat. I, Pt. 1, 397.

SINGAPORE: *Ridley* 5886.

5. TRISTANIA WHITEANA, Griff. Pl. Cantor. 18. A shrub, the young bark brown. *Leaves* oblanceolate, bluntly acuminate, much narrowed to the short petiole; both surfaces shining, the lower pellucid-punctate, pale: main-nerves numerous (about ·05 in. apart), sub-horizontal; length 3 to 5·5 in.; breadth ·75 to 1·75 in.; petiole ·25 to ·5 in. *Cymes* on peduncles nearly as long as the leaves, corymbosely paniculate, minutely pubescent, axillary and terminal, the bracts few and leaflike; bracteoles small caducous. *Flowers* numerous, on pedicels shorter than themselves, ·1 in. across. *Calyx-tube* obconic, densely pubescent on both surfaces, its teeth obsolete. *Petals* orbicular, glandular. *Capsule* under ·1 in. in diam., free from the calyx except at the base. *T. Wightiana*, Duthie in Hook. fil. Fl. Br. Ind. II, 466. *T. sumatrana*, Miq. Fl. Ind. Bat. Suppl. 308. *Hypericinea pimentifolia*, Wall. Cat. 4828.

Malacca: *Griffith* (K.D. 2340). Singapore: *Wallich*, *Lobb*. Penang: *Walker* 62. Distrib.—Sumatra, Java, Borneo.

NOTE.

In Hooker's Flora of British India *T. burmannica*, Griff. is said to have been collected at Malacca. I find however no specimens from that locality in either the Kew or the Calcutta Herbarium; and I therefore omit it here.

5. Rhodamnia, Jack.

Shrubs or small trees. *Leaves* opposite, 3-nerved, hoary or pubescent beneath. *Flowers* rather small, pedicels short, sometimes shortly fasciculate or in short lax racemes; bracteoles small, deciduous. *Calyx-tube* ovoid or subglobose, not produced beyond the ovary; segments 4, persistent. *Petals* 4, spreading. *Stamens* numerous, in several series, free; filiments filiform; anthers versatile with parallel cells dehiscing longitudinally. *Ovary* 1-celled with parietal placentas and many ovules; style filiform, stigma peltate. *Berry* globose, crowned with the limb of the calyx. *Seeds* few, reniform, globose or variously compressed, testa hard; embryo horseshoe-shaped, radicle long, cotyledons very short. Distrib.—About 6 species; Australia, and Tropical Asia.

Rhodamnia trinervia, Blume Mus. Bot. Lugd. Bat. I, 79. A small tree or a shrub: young parts and inflorescence often silky. *Leaves* ovate-oblong or oblong-lanceolate, acuminate, 3-nerved; upper surface glabrous, reticulate; the lower glabrous or silvery pubescent; length 1·75 to 4·5 in.; breadth ·75 to 2 in.; petiole ·2 to ·35 in. *Peduncles* varying in length but always much shorter than the leaves, axillary, 1- rarely 3-flowered, minutely bracteolate near the calyx. *Fruit* globose, reddish, ·2 to ·3 in. in diam. Kurz in Journ. As. Soc. Beng. XLVI, Pt. 2, 63; For. Fl. Br. Burma I, 474: Benth. Fl. Austral. III, 278; Duthie in Hook. fil. Fl. Br. Ind. II, 468. *Myrtus trinervia*, Sm. in Trans. Linn. Soc. III, 280. *Eugenia? trinervia*, DC. Prod. III, 279: Bot. Mag. 3223.

In all the Provinces except the Andaman Islands; common. Distrib. —The Malayan Archipelago and Philippines to Australia, Burma.

var. *concolor*; leaves green on both surfaces, sparingly pubescent, peduncles 4–7- or fewer-flowered. *R. cinerea*, Griff. Notul. 653, not of Jack; Kurz in Journ. As. Soc. *l.c.* *R. concolor*, Miq. Fl. Ind. Bat. Suppl. I, 315. *Myrtus smilacifolia*, Wall. Cat. 3629.

var. *spectabilis*; leaves silvery-white beneath or greyish when old, flowers usually fewer, 2 or solitary. *R. spectabilis*, Blume Mus. Bot. I, 78; Miq. Fl. Ind. Bat. I, Pt. 1, 479; Kurz *l.c.* *R. cinerea*, Jack. in Mal. Misc. *Monoxora spectabilis*, Wight Ill. II, 12, t. 97, f. 5,

R. Nageli, Miq. Fl. Ind. Bat. I, Pt. 1, 478. *R. subtriflora* and *R. Mulleri*, Bl. *l.c.* 79.

This species, being widely distributed, presents many forms several of which have been described as species. The above arrangement of these forms into two varieties was first suggested by Kurz.

6. Rhodomyrtus, DC.

Small trees or tomentose shrubs. *Leaves* opposite, 3-nerved. *Flowers* rather large, axillary. *Calyx-tube* turbinate, oblong or sub-globose, slightly produced above the ovary; lobes 5, rarely 4, herbaceous, persistent. *Petals* 5, rarely 4, spreading. *Stamens* indefinite, free, in many series. *Ovary* 1- 2- 3-celled with spurious partitions, or divided into numerous 1-ovuled superposed cells; style filiform, stigma capitate. *Berry* globose or ovoid, with few or numerous seeds not distinctly superposed in rows. *Seeds* compressed, reniform or nearly orbicular, horizontal, testa hard; embryo curved or spiral, radicle very long, cotyledons small. Distrib.—5 species, four of them inhabitants of E. Australia, and one widely distributed over Tropical Asia, especially throughout the Indian Archipelago, as far as China.

Rhodomyrtus tomentosa, Wight Spicil. Neilgh. I, 60, t. 71. A shrub 4 to 8 feet high: young parts tomentose. *Leaves* the lower ternate, the upper opposite, elliptic to obovate, obtuse, sometimes mucronate, 3-nerved, the under surface covered with soft white tomentum, the upper glabrous: length 1·5 to 2·5 in.; breadth ·65 to 1 in.; petiole ·1 to ·15 in. *Peduncles* axillary shorter than the leaves, 1–3-flowered, bracteolate close to the calyx. *Flowers* ·5 to ·75 in. across. *Calyx* tomentose, with 5 unequal lobes. *Petals* downy, shortly clawed. *Berry* about the size of a cherry, oval or sub-globose, dark-purple: pulp abundant, sweet. *Seeds* compressed, forming 2 rows in each cell. Miq. Fl. Ind. Bat. I, Pt. 1, 477; Benth. Fl. Hongk. 121; Duthie in Hook. fil. Fl. Br. Ind. II, 469; Trimen Fl. Ceylon. II, 166. *Myrtus tomentosa*, Ait.; DC. Prodr. III, 240; Vahl Symb. II, 56; Blume Bijdr. 1081; W. & A. Prodr. I, 328; Wight Ill. II, 12, t. 97, f. 3, Ic. 522; Roxb. Fl. Ind. II, 498; Wall. Cat. 3630; Korth. in Ned. Kruidk. Arch. I, 197. *M. canescens*, Lour. Fl. Cochinc. I, 311.

Penang, Malacca, Perak. Distrib.—Malayan Archipelago. Hills of Southern British India and Ceylon.

7. Decaspermum, Forst.

Shrubs or small trees. *Leaves* opposite, pinnate-nerved. *Flowers* small, in axillary racemes, or in terminal leafy panicles, occasionally polygamous. *Calyx-tube* campanulate, slightly or not at all produced

above the ovary; lobes 4 or 5, spreading. *Petals* 4 or 5, spreading. *Stamens* numerous in several series, free, filaments filiform; anthers small, versatile, with parallel cells opening longitudinally. *Ovary* 4- or 5-celled with 2 or very few ovules in each cell; cells often divided by spurious dissepiments; style filiform, stigma peltate. *Berry* globose, crowned by the calyx-lobes. *Seeds* 8 to 10, reniform-sub-globose, testa hard; embryo horse-shoe-shaped or circular, with long radicle and short cotyledons. DISTRIB —About 4 species in tropical Asia, Australia, and the Pacific Islands.

DECASPERMUM PANICULATUM, Kurz in Journ. As. Soc. Beng. XLVI, Pt. 2, 61: For. Flora. Br. Burma I, 475. A small tree, often 30 feet high. Young parts and inflorescence minutely sericeous-tomentose. *Leaves* membranous or thinly coriaceous, oblong-lanceolate or ovate-lanceolate, acuminate, the base often narrowed, edges entire; main-nerves about 10 pairs, spreading, not prominent; upper surface glabrous: the lower paler and reddish, glandular, midrib always pubescent on the lower and always on the upper; length 1·25 to 3·5 in.; breadth ·4 to 1 in.; petiole ·1 to ·3 in. *Panicles* axillary and shorter than the leaves, or terminal and longer than the leaves; bracts small and deciduous, or leaf-like and permanent. *Flowers* ·2 to ·3 in. in diam., often polygamous. *Petals* white, pubescent inside. *Calyx-tube* more or less clothed with white hairs; the lobes roundish or sub-acute, hairy or glabrous. *Style* exserted. *Berry* globose, about ·1 in. in diam. Duthie in Hook. fil. Fl. Br. Ind. I, 470. *Nelitris paniculata*, Lindl. Collect. Bot. under 16; DC. Prod. III, 231; Wall. Cat. 3627; Wight Ill. II, t. 97, fig. 10. Icon. 521; Benth. Fl. Austral. III, 279. *N. polygama*, Spreng. Syst. II, 488; Korth. in Ned. Kruidk. Arch. I, 197. *N. pallescens*, Miq. Fl. Ind. Bat. Suppl. 314. *Eugenia polygama*, Roxb. Hort. Beng. 92; Fl. Br. Ind. II, 491. *E. cuspidata*, Wall. Cat. 3627. *Memecylon acuminatum*, Wall. Cat. 4105; *Syzygium vimineum*, Wall. Cat. 3593 B. *Hirœa Finlaysoniana*, Wall. Cat. 3566 F.

In all the provinces except the Andaman and Nicobar Islands: common. DISTRIB.—Malayan Archipelago, Burma, Khasia Hills, Sikkim Terai.

Various other forms to which specific names have been given appear to me to be reducible here. The Wallichian examples in Herb. Calcutta of Wall. Cat. 3593 B and 4105 belong in my opinion to this species.

VAR. *Finlaysoniana*, Duthie *l.c.*; leaves sub-coriaceous, panicles shorter than the leaves, few-flowered, calyx densely tomentose, its lobes rounded: stamens nearly equalling the petals. *N. polymorpha*, Blume Mus. Bot. Lugd. Bat. I, 75, t. LX. *Hirœa Finlaysoniana*, Wall. Cat. 7363.

8. Eugenia, Linn.

Trees or shrubs, smooth or rarely tomentose or setose. *Leaves* opposite rarely alternate, coriaceous or membranous, pinnate-nerved. *Inflorescence* centripetal with solitary axillary flowers, or in short racemes or centrifugal in dense terminal or axillary cymes or in terminal or lateral trichotomous panicles. *Bracts* usually small and deciduous. *Calyx-tube* globose or more or less elongate, 4- or 5-lobed or sub-truncate. *Petals* 4 or 5, free and spreading or connivent calyptrate and caducous. *Disc* lining the calyx-tube, staminiferous at the edge. *Stamens* numerous, in many rows, usually combined in 4 or 5 bundles; filaments slender; anthers small, versatile, dehiscing longitudinally. *Ovary* inferior, 2- rarely 3-celled; ovules many in each cell; style filiform, stigma small. *Fruit* inferior, crowned by the remains of the calyx, pulpy, rarely dry. *Seeds* few, oblong or globose, often compressed, testa membranous or cartilaginous, albumen none or very scanty; embryo thick, fleshy. Distrib.—About 650 species chiefly in tropical America and Asia; a few in tropical Africa and Australia.

Sect. I. Jambosa. Flowers usually 4-merous, often large. *Calyx* clavate, funnel-shaped or sub-globose, its staminal disc often thickened and its mouth with 4-persistent often thickened lobes crowning the fruit. *Petals* free, *Berry* pulpy; seeds large.

Leaves large—

Leaves with their main nerves under 20 pairs, bold, the reticulations inconspicuous, mostly from 8 to 14 in. long (except in Nos. 8, 9 and 10)—

Flowers 1 inch or more across—

Leaves on very short inconspicuous petioles, auricled at the cordate base, often amplexicaul ... ... { 1. *E. formosa.* 2. *E. Perakensis.* 3. *E. javanica.*

Leaves neither cordate nor amplexicaul but narrowed at the base ... ... { 4. *E. Jambos.* 5. *E. malaccensis.*

Flowers half an inch or at most three quarters of an inch across—

Leaves glabrous—

Young branches sub-terete or compressed ... { 6. *E. pseudo-formosa.* 7. *E. papillosa.* 8. *E. densiflora.* 9. *E. plumbea.*

Young branches 4-angled ... ... 10. *E. Scortechinii.*

Leaves hairy beneath; flowers in terminal panicles 11. *E. mollis.*

Leaves 8 to 16 in. long, with very numerous (more than 20 pairs) of bold distinct sub-horizontal main nerves; flowers half an inch or more in diameter—

Reticulations of leaves distinct ... ... { 12. *E. quadrata.* 13. *E. scalarinervis.* 14. *E. pergamentacea.*

Reticulations of leaves faint ... ... { 15. *E. Dyeriana.* 16. *E. Hemsleyana.*

Leaves small—

Leaves 2·5 to 8 in. long (longer in No 19)

Flowers in terminal spreading panicles—

Leaves obovate, oblanceolate, or broadly elliptic ... { 17. *E. pachyphylla.* 18. *E. lepidocarpa.* 19. *E. garcinifolia.* 20. *E. crenulata.*

Leaves oblong, ovate or elliptic, tapering slightly at each end ... ... { 21. *E. grandis.* 22. *E. Thumra.* 23. *E. Griffithii.* 24. *E. Clarkeana.* 25. *E. corrugata.*

Leaves ovate-lanceolate or narrowly elliptic (sometimes broadly elliptic in *E. pyrifolia*) much narrowed to each end, the apices sometimes caudate-acuminate—

Flower-buds clavate ... ... { 26. *E. pendens.* 27. *E. Burkilliana.* 28. *E. Helferi.* 29. *E. Kurzii*, VAR. *andamanica.* 30. *E. anisosepala.* 31. *E. Gageana.* 32. *E. Hullettiana.* 33. *E. chlorantha.* 34. *E. penangiana.*

Flower-buds globular, not clavate ... ... { 35. *E. Ridleyi.* 36. *E. pyrifolia.* 37. *E. lineata.* 38. *E. cymosa.*

Flowers in small axillary or terminal racemes or in lax racemose few-flowered panicles—

Flower buds globular or slightly elongated ... ... { 39. *E. conglomerata.* 40. *E. urceolata.* 41. *E. glauca.* 42. *E. subrufa.* 43. *E. Duthieana.* 44. *E. polyantha.* 45. *E. Manii.* 46. *E. caudata.*

Flower-buds and flowers much elongated ... ... { 47. *E. filiformis.* 48. *E. andamanica.*

Flowers in dense short terminal or axillary glomeruli or cymes—

Flowers not conspicuously bracteolate—

Flower-buds globular ... ... 49. *E. Hoseana.*

Flower-buds much elongated ... ...
- 50. *E. Benjamina.*
- 51. *E. variolosa.*
- 52. *E. claviflora.*
- 53. *E. zeylanica.*
- 54. *E. grata.*
- 55. *E. tecta.*

Flowers in conspicuously bracteolate dense clusters, branches 4-angled ... ...
- 56. *E. pseudo-tetraptera.*
- 57. *E. polita.*

Sect. II. Syzygium. Flowers 4- or 5-merous, usually small: the calyx obovoid, turbinate or clavate, its staminal disc rarely thickened, the mouth 4- or 5-toothed or lobed or sub-entire. *Petals* more or less connate, much imbricate and calyptrately deciduous. *Berries* small, sub-globose or oblong, often with little pulp.

Flowers panicled, their buds ·2 in. or more in length (less in *E. nigricans* and *E. expansa*), clavate, always narrowed into a long pseudo-stalk—

Leaves more than 2 inches long—

Main-nerves of leaves under 25 pairs, distinct—

Panicles large, lax, spreading, mostly terminal ...
- 58. *E. valdevenosa.*
- 59. *E. oblongifolia.*
- 60. *E. sub-horizontalis.*

Panicles short, both axillary and terminal ... ...
- 61. *E. Valetoniana.*
- 62. *E. expansa.*
- 63. *E. chloroleuca.*

Nerves of leaves very numerous, close together and equally distinct or often all obscure ... ...
- 64. *E. nigricans.*
- 65. *E. inophylla.*
- 66. *E. oblata.*
- 67. *E. Bernardi.*
- 68. *E. Prainiana.*
- 69. *E. Pearsoniana.*
- 70. *E. lævicaulis.*
- 71. *E. Goodenovii.*

Leaves 2 inches or less in length, rarely as much as 2·5 in.—

Glabrous—

Fruit oblong ... ...
- 72. *E. linocieroidea.*

Fruit globose or sub-globose ... ...
- 73. *E. myrtifolia.*
- 74. *E. Stapfiana.*
- 75. *E. Wrayi.*

Setose ... ...
- 76. *E. setosa.*

Flowers numerous, less than ·2 in. long, in terminal or axillary panicles, oblong or clavate, tapered gradually to the base, rarely narrowed into a short pseudo-stalk, all without a true pedicel except sometimes the terminal ones of the branchlets.

Leaves obtuse or sub-acute ... ...
- 77. *E. inasensis.*
- 78. *E. subdecussata.*
- 79. *E. punctulata.*

Leaves obtuse or sub-acute...	80. *E. bracteolata.* 81. *E. venulosa.* 82. *E. pseudo-subtilis.* 83. *E. microcalyx.* 84. *E. scoparia.* 85. *E. myriantha.*
Leaves more or less acuminate	86. *E. verecunda.* 87. *E. pseudo-subtilis* VAR. *sub-acuminata.* 88. *E. Swettenhamiana.* 89. *E. acuminatissima.* 90. *E. Kunstleri.* 91. *E. pustulata.* 92. *E. Koordersiana.* 93. *E. simulans.* 94. *E. Curtisii.*
Flowers small, numerous, in short much-branched spreading cymose panicles mostly from the scars of fallen leaves; globular or nearly so, narrowed gradually to the base or abruptly contracted into a short pseudo-stalk.	95. *E. operculata.* 96. *E. nicobarica.* 97. *E. Jambolana.*

1. EUGENIA FORMOSA, Wall. Pl. As. Rar. II. 6, t. 108: Wall. Cat. (in part) 3609. A tree, 20 to 30 feet high: young branches almost terete, with pale bark. *Leaves* coriaceous, ovate-oblong to lanceolate-oblong, much tapered to the acute apex, sometimes in threes; the base rounded, slightly cordate; upper surface pale, olivaceous (when dry), the lower paler; both quite smooth; main-nerves 12 to 20 pairs, rather strong, ascending, rather straight, interarching ·2 to ·3 in. from the edge; length 8 to 12 occasionally to 18 in.; breadth 3 to 5 in.; petiole about ·2 in. *Flowers* about 2 in. across (excluding the stamens), pale rose-coloured, on pedicels ·3 to ·5 in. long, bracteolate near the apex, in fascicles of three (occasionally solitary), usually from the branches below the leaves but sometimes terminal. *Calyx-tube* ·6 to ·75 in. long, clavate-turbinate, smooth; the 4 lobes broad, rounded, unequal, ·5 in. broad and about half as long. *Petals* ·5 in. long, almost orbicular. *Filaments* more than 1 in. long, very numerous, spreading. *Fruit* as large as a small apple, globose, contracted towards the base, crowned at the apex by the spreading calyx-lobes, white, smooth, 2-seeded, the pulp rather scanty. Duthie in Hook. fil. Fl. Br. Ind. II, 471; Kurz in Journ. As. Soc. Beng. XLVI, Pt. 2, 68; For. Fl. Brit. Burm. I, 492; Wight Ill. II, 14. *Jambosa formosa*, Walp. Rep. Bot. II, 191; Blume Mus. Bot. I, 92; Miq. Fl. Ind. Bat. I, Pt. 1, 412. *J. mappacea*, Korth. in Ned. Kruidk. Arch. I, 200. *E. somarangensis*, DC. Prod. III, 286.

PERAK: *King's Collector* 6254; *Scortechini.*

Only a few specimens of this are to be found from our area in the Herbaria at Kew and Calcutta, and they have all oblong-lanceolate leaves. In British India the form with ovate-oblong leaves is the commoner.

2. EUGENIA PERAKENSIS, King n. sp. A glabrous tree, 50 to 70 feet high: young branches as thick as a swan-quill, brown when dry. *Leaves* coriaceous, oblong-elliptic, the apex sub-acute, narrowed gradually to the cordate, slightly oblique base; upper surface olivaceous when dry, the lower pale-brown; main-nerves 12 to 14 pairs, ascending, curving a little and interarching ·2 to ·4 in. from the edge, very prominent on the lower surface, faint on the upper; intermediate nerves and reticulations slender but distinct; length 12 to 18 in.; breadth 5 to 8 in.; petiole 3 in. very stout. *Flowers* 1 in. or more across, in fascicles of 6 to 8 from depressed tubercles on the smaller branches, on peduncles ·5 in. long. *Calyx-tube* campanulate, ·5 in. long, contracted into a pseudo-stalk at its junction with the peduncle: the mouth with 4 broad, rounded lobes less than 1 in. long. *Petals* orbicular, longer than the calyx-lobes. *Fruit* unknown.

PERAK: *King's Collector* 5595.

A species only once collected and the specimens have no fruit; somewhat resembling *E. macrocarpa*, Roxb., but with smaller flowers and larger leaves.

3. EUGENIA JAVANICA, Lamk. Dict. III, 200. A glabrous tree, 25 to 35 feet high: young branches terete, pale-brown. *Leaves* thinly coriaceous, elliptic-oblong, elliptic-lanceolate or elliptic, the apex acute or subacute, slightly narrowed to the rounded (sometimes slightly cordate) base; both surfaces pale-brown when dry: main-nerves slightly conspicuous on the lower surface, 8 to 12 pairs, slightly curved, spreading, interarching about ·1 in. from the edge; length 4 to 8 in.; breadth 1·75 to 3·5 in.; petiole ·1 to ·2 in. *Flowers* 1 in. or slightly more in diam. (excluding the stamens) white, in axillary or terminal lax pedunculate few-flowered corymbose racemes: peduncle of racemes from 1 to 1·25 in. in length; pedicels of flowers ·4 to ·6 in. long. *Calyx-tube* clavate-turbinate, smooth, ·35 to ·5 in. long, tapering into a short pseudo-stalk, the 4 lobes broad, unequal, rounded, blunt, concave. *Petals* obovate-orbicular, larger than the sepals. *Filaments* slender, about ·75 in. long. *Fruit* when quite ripe depressed-turbinate, about 1·5 in. long and 2 in. broad at the apex, pale-yellowish, 1- or few-seeded, the endocarp spongy. Duthie in Hook. fil. Fl. Br. Ind. II, 474; Kurz in Journ. As. Soc. Beng. XLVI, (1877), Pt. 2, 69; For. Fl. Brit. Burm. I, 494. *E. alba*, Roxb. Hort. Beng. 39; Fl. Ind. II, 493; Wall. Cat. 3612A, 3614 all the numbers. *Jambosa alba*, Rumph Herb. Amb. I, 127, t. 39; W. & A. Prodr. I, 332; Wight Ill. II, 14; Ic. t. 548; Miq. Fl. Ind. Bat. I, Pt. 1, 443 (*in part*). *J. samarangensis*, Korth. in Ned. Kruidk. Arch. I, 201; Blume Mus. Bot. I, 95. *Jambosa macrophylla*, DC. Prod. III. 286 (*in part*). *Myrtus samarangensis*, Blume Bijdr. 1084. *Jambosa insignis*, Bl. Mus. Bot. I, 100. *Jambosa ambigua*, Bl. Mus. Bot. I, 96.

Malacca: *Griffith* 2352, *Maingay* 748, *Hervey*. Singapore: *Ridley* 8931. Andaman and Nicobar islands (very common). Distrib.—Java, *Zollinger*, 2nd Journey 808, etc.; Timor Laut, *Forbes* 334; New Guinea and many of the other islands of the Archipelago.

Distinguished in the group by its shortly petiolate leaves and pedunculate lax racemes which are often terminal.

var. *Roxburghiana*, Duthie in Fl. Br. Ind. II, 475; leaves almost sessile, cordate and amplexicaul at the base, the apex rounded. *E. decora*, Wall. Cat. 3608.

4. Eugenia Jambos, Linn. Sp. Pl. 47. A shrub or small glabrous tree: young branches more or less four-angled, pale-brown, rather slender. *Leaves* thinly coriaceous, oblong-lanceolate, tapering to each end, the apex acuminate (sometimes almost caudate) the base more abruptly narrowed to the petiole; both surfaces pale-olivaceous when dry; the main-nerves distinct on the lower, 10 to 14 pairs, slightly curved, ascending, interarching in a rather faint nerve ·1 in. inside the edge, the secondary nerves rather distinct, one (sometimes two) between each pair of primaries; length 4 to 7 in.; breadth 1 to 1·6 in.; petiole ·25 in. *Flowers* 2·5 to 3 in. in diam., in few-flowered terminal racemes shorter than the leaves, the pedicels ·3 to ·4 in. long. *Calyx-tube* turbinate, ·5 in. long, the lobes 4, broad, short, reflexed. *Petals* much larger than the calyx-lobes, obovate-rotund, about ·5 in. long; filaments 1·5 to 2 in. long, shorter than the style. *Fruit* ovoid or globular, 1·5 to 2 in. long, dull-yellow tinged with pink, smooth, endocarp fleshy and edible, crowned by the inflexed calyx-lobes. *Seeds* one or two. Roxb. Hort. Beng. 37; Fl. Ind. II, 494; Wall. Cat. 3615; Wight Ill. II, 14; Duthie in Hook. fil. Fl. Br. Ind. II, 474. Brandis For. Fl. 233; Kurz in Journ. As. Soc. Beng. XLVI. (1877) Pt. 2, 69; For. Fl. Brit. Burm. I, 495. *Jambosa vulgaris*, DC.; Blume Mus. Bot. I, 93; W. & A. Prodr. I, 332; Bot. Mag. 3356; Miq. Fl. Ind. Bat. I, Pt. 1, 425; Wight Ic. 435. *Myrtus Jambos*, Kunth; Korth. in Ned. Kruidk. Arch. I, (1846), 200; Blume Bijdr. 1085.—Rumph. Herb. Amb. I, 123; Rheede Hort. Mal. I, 27, f. 17.

Cultivated in most of the provinces: perhaps wild in Perak; *Scortechini*; *Maingay* 735. Cultivated also in British India.

Readily distinguished in this section by its narrow leaves attenuated to each end and few-flowered terminal racemes.

5. Eugenia malaccensis, Linn. Sp. Plantar. 470. A glabrous tree, 30 to 40 feet high; young branches almost terete (slightly compressed) with pale bark. *Leaves* coriaceous, with short but distinct petioles, narrowly elliptic-oblong to oblanceolate-oblong, the apex more or less suddenly acute, the base much tapered to the petiole: when dry the upper

surface olivaceous the lower pale-brown: main-nerves 10 to 12 pairs, slightly curved upwards, interarching to form a marginal nerve ·1 in. to ·15 in. from the edge; length 6 to 11 in.; breadth 1·75 to 3 in.; petiole ·3 to ·5 in. *Flowers* 1 to 1·5 in. in diameter, in sessile or shortly pedunculate fascicles of three from the branches below the leaves. *Calyx-tube* obconic about ·5 in. long, tapering into the quarter inch long ebracteolate pedicel; calyx-lobes 4, broadly rounded, coriaceous, not reflexed. *Petals* orbicular, with a broad claw, the edges thin, about ·4 in. in diam. (when dry). *Fruit* about the size of a hen's egg, obovate, turbinate to elliptic-ovoid, smooth and glossy, from pale-rose-coloured to dark-purple, crowned by the inflexed calyx-lobes, edible. *Seed* usually solitary. Duthie in Hook. fil. Fl. Brit. India. II, 471; Roxb. Fl. Ind. II, 483; Wall. Cat. 3611; Wight Ill. II, 14, t. 98; Kurz in Journ. As. Soc. Beng. XLVI, Pt. 2, 68; For. Fl. Brit. Burm. I, 493. *E. macrophylla*, Lam. Encyc. III. 196. *Jambosa malaccensis*, DC. Prod. III, 286; Korth. in Ned. Kruidk. (1847), 200; Bot. Mag. 4408; W. & A. Prodr. I, 332. *J. purpurascens*, DC. *l.c.* excl. syn. Roxb. *J. domestica*, Rumph. Herb. Amb. I, 121, t. 37 (not good) and 38, f. i; DC. *l.c.* 288; Blume Mus. Bot. I, 91; Miq. Fl. Ind. Bat. I, Pt. 1, 411. *Myrtus macrophylla*, Spreng.; Blume Bijdr. 1084. *M. malaccensis*, Spreng.; Blume *l.c.* 1083. —Burm. Fl. Ind. 114; Rheede Hort. Mal. I, 29, t. 18.

Doubtfully wild in any of the Provinces, but frequently cultivated as it also is in Burma, the Malayan Islands and British India.

The variety with very dark purple ovoid-elliptic fruit was described as a species by Roxburgh and has the following synonymy:—*Eugenia purpurea*, Roxb. Hort. Beng. 37; Fl. Ind. II, 483; Wight Ill. II, 14; Ic. II, 549. *Jambosa purpurea*, Wall. Cat. 3610. *J. domestica*, var. *purpurea*, Blume Mus. Bot. I, 92; Miq. *l.c.*—*J. nigra*, Rumph. Amb. 125, t. 38, fig. 1 ?

6. Eugenia pseudo-formosa, King n. sp. A glabrous shrub; young branches slender, sub-terete, compressed near the nodes, pale. *Leaves* sub-coriaceous, elliptic or oblong-elliptic, acuminate, slightly narrowed to the rounded base; upper surface olivaceous-brown when dry, the lower pale yellowish-brown; main-nerves 14 to 20 pairs, curving upwards, interarching ·15 to ·25 in. from the margin; length 7 to 12 in.; breadth 3 to 5 in.; petiole ·1 or ·2 in. long, or absent. *Flowers* white tinged with red, sessile in densely crowded fascicles or very condensed cymes at the apices of the branches, ·6 in. in diam., the buds globular. *Calyx* ·4 in. long; the tube cylindric-campanulate, the mouth with 4 broad blunt lobes becoming hardly triangular. *Petals* orbicular. *Style* 1·5 in. long. *Stamens* and *fruit* unknown.

Perak: *Wray* 1809, 3581; *King's Collector* 3401, 5389, 6254; *Scortechini*. Singapore: *Ridley* 9520.

A species resembling *E. formosa* in its shrubby habit and its leaves; the latter are however thinner in texture and they have more numerous nerves. The flowers of this are however sessile fasciculate and much smaller in size. *Wray* 3688 and *Ridley* 9628, which has its clavate flower buds in very short racemes, is probably a form of this species. *E. samarangensis* DC. much resembles this but has its flowers in small racemes or panicles.

7. Eugenia papillosa, Duthie in Hook. fil. Fl. Br. Ind. II, 495. A tree 40 to 50 feet high: young branches stout about as thick as a goose-quill, terete, brown, those of the inflorescence 4-angled. *Leaves* coriaceous, somewhat amplexicaul, oblong-elliptic sometimes obovate-elliptic or lanceolate, subacute or blunt, narrowed to the cordate auriculate sub-amplexicaul base; upper surface smooth, shining, dark-olivaceous or blackish-brown; under surface reddish-brown; main-nerves 16 to 20 pairs, curving slightly upwards and interarching ·1 to ·2 in. from the edge, very prominent on the lower surface like the mid-rib, inconspicuous or depressed on the upper; length 8 to 12 in.; breadth 3 to 5 in.; petiole less than ·1, very thick. *Panicles* pedunculate, crowded at the apices of the youngest shoots or axillary, shorter than the leaves: the branches mostly short, divaricate, scurfy like the branchlets. *Flowers* (the stamens included) ·6 in. long, sessile and collected in globose-clavate bracteate heads of 5 to 8 at the apices of the branchlets; the bracts oblong, blunt, deciduous. *Calyx* ·35 in. long, funnel-shaped, narrowed above the middle to a pseudo-stalk: the limb wide and with 4 broadly triangular, unequal, reflexed, blunt lobes. *Petals* orbicular, three times as long as the calyx-lobes, not much shorter than the stamens. *Fruit* unknown. *E. anacardifolia*, King MSS.

Malacca; *Manigay* (K.D.) 737; *Holmberg* 873. Singapore: *Ridley* 3829. Perak: *Scortechini*; *King's Collector* 2813, 5869, 8475.

8. Eugenia densiflora, Duthie in Hook. fil. Fl. Br. Ind. II, 473. Shrubby, occasionally arboreous, glabrous: young branches compressed, pale-brown. *Leaves* coriaceous, narrowly elliptic-oblong, acuminate, the base cuneate, both surfaces glabrous, shining, finely reticulate, the upper olivaceous (when dry) the lower pale-brown; main-nerves 12 to 20 pairs, slender but distinct on both surfaces (when dry), ascending slightly, curved and interarching ·3 to ·4 in. from the edge, a second series of short arches being interposed between these and the margin; length 5 to 8 in.; breadth 1·75 to 2·5 in.; petiole ·35 to ·5 in. *Panicles* terminal, many-flowered, compact; the branchlets numerous and few-flowered. *Flower*-buds clavate, about ·5 in. long just before expansion. *Flowers* about ·75 in. across, white, much tinged with red. *Calyx-tube* funnel-shaped, ·3 to ·4 in. long, jointed to a stout pedicel shorter than itself; the 4 lobes, ·15 in. long, unequal, broad, rounded. *Petals* much larger than the calyx-lobes, sub-orbicular, much shorter than the

stamens. *Fruit* as large as a cherry, rose-coloured, globular, with a tough smooth epicarp, the apex crowned by the large calyx-lobes. *Seed* one, rarely two. *Jambosa densiflora*, DC. Prod. III, 287; Korth. in Ned. Kruidk. Arch. I, 200; Blume Mus. Bot. I, 93; Miq. Fl. Ind. Bat. I, Pt. 1, 416. *Myrtus densiflora*, Blume Bijdr. 1087. *Eugenia corymbosa*, Roxb. Fl. Ind. III, 497; Wight Ic. 627.

Malacca: *Mainyay* (K.D.) 760/1 762/2 (? 758). Perak: *King's Collector* 738, 4355, 4682, 5721, 5855, 5868, 7065, 8102, 10940; *Scortechini* 149, 743; *Wray* 544. Singapore: *Ridley* 356, 5072. Pahang: *Ridley* 2646. Penang: *Curtis* 3431. Distrib.—Sumatra, Java.

A very handsome species somewhat resembling *E. Jambos*, L. but distinguished by its dense terminal panicles of flowers which are individually smaller than those of that species, also by its broader leaves, and smaller fruit; allied to *E. pendens*, Duthie and *E. garcinifolia*, King.

9. Eugenia plumbea, King n. sp. A glabrous tree; young branches only as thick as a crow-quill, 4-angled, with dark bark. *Leaves* thinly coriaceous, lanceolate, acuminate, somewhat narrowed at the base; both surfaces of a dull leaden colour when dry, the upper shining, the lower dull; main-nerves 10 to 12 pairs, prominent on the lower, depressed on the upper surface; length 3 to 4 in.; breadth 1 to 1·5 in.; petiole ·1 in. *Flowers* about ·75 in. in diam., greenish-white, in terminal or axillary shortly pedunculate racemes of about three. *Calyx* ·6 in. long, campanulate or widely funnel-shaped, suddenly contracted just above its insertion on the short pedicel; the mouth wide, divided into four broad, rounded segments ·15 in. long. *Petals* rotund-reniform, longer than the calyx-teeth, shorter than the stamens. *Fruit* unknown.

Perak: on Gunong Pateh, elevat. 3400 feet; *Wray* 479.

A species resembling this has been collected in Borneo by Mr. Ridley (Herb. Ridley 9071).

10. Eugenia Scortechinii, King n. sp. A glabrous shrub or tree: young branches thicker than a crow-quill, boldly 4-angled, winged below the nodes. *Leaves* scantily pellucid-dotted, sub-coriaceous, ovate-oblong to oblong-lanceolate, acute rarely acuminate, narrowed to the rounded occasionally minutely cordate base; both surfaces brown when dry, the lower paler; main nerves 7 to 10 pairs, prominent on the lower surface, curving upwards, and joining to form a bold nerve ·2 in. from the edge, between which and the edge is a second series of minute arches; length 4 to 6 in.; breadth 1·35 to 2·35 in.; petiole ·15 in. sometimes absent. *Racemes* terminal and in the upper leaf-axils, corymbose, condensed, very much shorter than the leaves, 3- to 9-flowered. *Flowers* pale-red, with some yellow in the centre, about ·65 in. in diam., on very short pedicels. *Calyx* shortly and widely campanulate, ·4 in. long,

smooth, the mouth with very broad short unequal lobes, very little contracted at the base. *Petals* red, orbicular, longer than the calyx-lobes, much shorter than the stamens. *Fruit* broadly oblong, the apex truncate and crowned by the thick, deep, cup-shaped calyx, about ·5 in. long, the base abruptly contracted into a short pseudo-stalk.

PERAK: *Scortechini* 649; *King's Collector* 4734, 7801, 10076. MALACCA: *Manigay* (K.D.) 736.

This resembles *E. diospyrifolia*, Wall., but that species has long-stalked flowers, with a narrower calyx-tube, and the nervation of the leaves is different. This also resembles *E. coarctata*, Blume, which however differs in having pale terete young branches and larger leaves, and *E. æmula*, Blume, from which it differs in the number of the nerves of the leaves and in its thicker young branches. From *E. macrocarpa*, Roxb., this differs in its much thinner quadrangular branches and much smaller flowers and fruit.

VAR. *parvifolia; leaves* narrowly oblong-lanceolate, only from 3 to 6 in. long and ·8 to 1·25 in. broad.

PERAK: *King's Collector* 3348, 10437.

11. EUGENIA MOLLIS, King n. sp. A hairy shrub or small tree: young branches slender, pale-brown, 4-angled like the rachis and branches of the panicle but not winged, covered with short, thick, brown hairs. *Leaves* sub-coriaceous, oblong-lanceolate, the apex finely acuminate, slightly narrowed to the rounded, slightly cordate base; upper surface pale olivaceous-brown, subglabrous; the lower darker and everywhere covered with hairs like those on the young branches and inflorescence; length 8 to 12 in.; breadth 1·75 to 4 in.; petiole ·1 to ·2 in. *Panicles* terminal, shortly pedunculate, nearly as long as the leaves; the branches spreading and more or less trichotomous at their extremities. *Flowers* numerous but not crowded, about ·5 in. across when expanded. *Calyx-tube* ·4 in. long, clavate, densely and minutely scurfy-hairy tapering much to the short pedicel; the mouth ·3 in. across, divided into 4 subequal rounded lobes about ·1 in. long, their edges thin and glabrous. *Petals* orbicular, white, much longer than the calyx-lobes. *Fruit* ovoid-globose, crowned by the cupular calyx, covered with deciduous scurf-like hairs, ·6 in. long.

PERAK: *King's Collector* 2686, 2808, 5572, 8387; *Wray* 2372. DISTRIB.—Sumatra, *Forbes* 1475.

12. EUGENIA QUADRATA, King n. sp. A glabrous tree, 20 to 30 feet high: young branches as thick as a goose-quill, acutely 4-angled and narrowly winged, pale-brown. *Leaves* thinly coriaceous, narrowly oblong, much acuminate, slightly narrowed and cordate at the rounded base; upper surface pale olivaceous-brown when dry, the lower darker brown and often not olivaceous; main-nerves 20 to 25 pairs, slender,

distinct, interarching ·1 in. from the margin; the reticulations minute; length 8 to 10 in.; breadth 1·75 to 2·75 in.; petiole very short ·05 in. long. *Cymes* very short, glomerulate, 3-flowered, pedunculate, solitary and axillary or in groups of 3 or 4 and terminal, about 2 to 3 in. long; their peduncles compressed, 1 to 1·5 in. long. *Flowers* white, about ·75 in. in diam.: *calyx-tube* ·5 in. long, widely campanulate, suddenly contracted into a long pseudo-stalk, epedicellate; calyx-lobes 4, unequal, broad, rounded, only ·1 in. long or less, reflexed. *Petals* orbicular, much larger than the calyx-lobes. *Stamens* slightly exceeding the petals. *Fruit* unknown.

PERAK: *King's Collector* 5547.

In shape and nervation the leaves of this somewhat resemble those of *E. mollis*, King.

13. EUGENIA SCALARINERVIS, King n. sp. A glabrous tree, 20 to 30 feet high: young branches nearly as thick as the little finger, slightly compressed, pale. *Leaves* coriaceous, elliptic-ovate, sub-acute, the base rounded and cordate; upper surface brown slightly tinged with olivaceous (when dry), the lower much paler; main-nerves 22 to 30 pairs, very prominent on the lower and depressed on the upper surface, curving very slightly upwards and interarching ·15 in. from the margin, the intermediate nerves rather distinct, the reticulations few and large; length 10 to 14 in.; breadth 5 to 7 in.; petiole about ·3 in., stout, wrinkled when dry. *Flowers* in much contracted few-flowered terminal racemes, 1·5 in. or more across. *Calyx-tube* magenta-coloured (*fide collector*), smooth, ·75 in. long, contracted at the base into a pseudo-stalk ·15 in. long and jointed to a pedicel ·15 in. long; the mouth wide, divided into 4 broadly-triangular teeth ·15 in. long. *Petals* unknown. *Style* about 1 in. long, the stamens shorter. *Fruit* (unripe) globular-ovoid, crowned by the large, wide-tubular, 4-lobed calyx-limb ·75 in. long.

PERAK: *King's Collector* 8200; *Ridley* 3095.

The specimens of this very fine species are scanty and imperfect. It is distinguished by the great size of its leaves and by the large number and the prominence of their sub-horizontal nerves.

14. EUGENIA PERGAMENTACEA, King n. sp. A tree?; young branches terete, as thick as a quill, pale-brown. *Leaves* chartaceous-coriaceous, narrowly elliptic-oblong, abruptly and shortly acuminate, the base cuneate; upper surface when dry shining and of a dull leaden-colour; the lower brown, both finely and transversely reticulate; main-nerves 28 to 32 pairs, very regular, straight, slightly ascending, interarching ·15 in. from the margin, prominent on the lower, depressed on the upper surface; length 12 to 16 in.; breadth 4 to 6 in.; petiole ·5

in., laterally compressed. *Panicles* 3 or 4 inches long, solitary in the leaf-axils or in groups of 2 or 3 at the apices of the branches; the branchlets few, short, spreading, bearing 3 or 4 flowers at their apices. *Flowers* ·6 in. in diam.; depressed globular in bud. *Calyx-tube* shortly and widely campanulate, suddenly contracted into a pseudo-stalk ·1 in. long: the teeth 4, short, unequal, rounded, inflexed. *Petals* 4, orbicular-ovate, pellucid-dotted, not much longer than the stamens, free. *Fruit* globular, smooth, crowned by the short calyx-cup, 1 in. in diam., black when dry. *Syzygium subdecussatum*, Wall. Cat. 5589 *in part.*

PENANG: *Curtis* 1440.

Since the time of Wallich who issued it along with his *Syz. subdecussatum* this has been collected by Mr. Curtis only. The elongate leaves of parchment-like texture with many straight very regular nerves and short panicles and globular fruit distinguish it.

15. EUGENIA DYERIANA, King n. sp. A tree, 40 to 50 feet high; young branches as thick as a goose-quill; young branches terete below, compressed near the apex, dark-brown. *Leaves* thickly coriaceous, elliptic, (oblong in the variety), slightly narrowed at each end; both surfaces dark-brown when dry and shining; the upper with midrib and main-nerves impressed, the reticulations invisible; the lower of a warmer brown colour, the main-nerves and midrib (but not the reticulations) very bold: main-nerves 13 to 20 pairs, slightly curved, ascending, interarching ·1 in. or more from the recurved edge; length 7 to 9 in.; breadth 3·5 to 5 in.; petiole ·4 to ·6 in.; short. *Panicles* narrow, few-flowered, much shorter than the leaves, terminal or from the upper leaf-axils, usually pedunculate: branches few, short, spreading, much compressed, the flowers crowded at their apices. *Flowers* ·4 in. across when expanded, sessile, obovoid in bud. *Calyx* campanulate, ·3 in. long, abruptly constricted into a very short pseudo-stalk, the mouth wide and with 4 small rounded lobes. *Petals* 4, free, not calyptrate, orbicular. *Stamens* white, only ·25 in. long. *Fruit* (unripe) globular, smooth, crowned by the small, short, circular remains of the calyx, ·75 in. in diam.

PERAK: *Scortechini* 2018; *Wray* 2094; *King's Collector* 6196, 6404, 6767.

VAR. *oblonga; leaves* oblong or narrowly oblong-elliptic, 4 to 8 in. long and 1·25 to 2·75 in. broad; panicles nearly as long as the leaves.

PERAK: *King's Collector* 7669.

A species near *E. Clarkeana*, King, but with larger leaves with more nerves, larger flowers but smaller panicles.

16. EUGENIA HEMSLEYANA, King n. sp. A tree, 30 or 40 feet high: young branches thinner than a goose-quill, the bark yellowish-grey.

Leaves large, rigidly coriaceous, elliptic or elliptic-oblong, shortly and bluntly acuminate, slightly narrowed at the base; both surfaces, but especially the upper, dark when dry, the upper shining with the nerves impressed, the lower somewhat paler, dull and the nerves prominent; main-nerves 20 to 25 pairs, slightly curved upwards and interarching ·1 to ·2 in. from the edge: length 6 to 9 in.; breadth 3 to 3·5 in.; petiole ·3 to ·35 in. stout. *Panicles* mostly on long 4-angled striate peduncles, terminal, shorter than the leaves, crowded in groups of 6 to 8 at the apices of the twigs; branches few, a long one often from the very base, the remaining short (mostly under one inch), all compressed, and each bearing at its apex a dense capitule of sessile flowers ·3 or ·4 in. across. *Calyx* ·15 in. long, campanulate, contracted and ribbed at the base but not forming a pseudo-stalk; the mouth with 4 broad, rounded, concave teeth. *Fruit* (unripe) globular with numerous bold vertical ribs, the apex crowned by the calyx-lobes.

PERAK: *Wray* 1803; *King's Collector* 6114, 8697.

The species nearest to this is *E. pergamentacea* which however has larger leaves, fewer panicles and considerably larger flowers.

17. EUGENIA PACHYPHYLLA, Kurz in Journ. As. Soc. Beng. XLII, Pt. 2, 332. A glabrous tree: the young branches slender, terete, pale-yellow when dry. *Leaves* coriaceous, obovate to obovate-oblong, the apex abruptly and broadly apiculate, the base cuneate; upper surface olivaceous-brown when dry, the lower pale-brown: main-nerves 12 to 15 pairs, slender but distinct on the lower surface, spreading, slightly curved and interarching about ·1 in. from the margin, length 3·5 to 5 in.; breadth 2 to 2·25 in.; petiole ·2 to ·3 in. *Flowers* ·3 in. in diam., in pedunculate few-flowered corymbose racemes or panicles axillary or clustered at the apices of the branches, the common peduncles 1 to 1·5 in. long, those of the branchlets (in the panicles) half as long, all 4-angled, the flowers themselves sessile at the apices, the buds globose-clavate. *Calyx* in the expanded flower ·4 in. long, widely funnel-shaped, suddenly contracted into a cylindric tube, the 4 lobes of the mouth about ·2 in. long, broad, rounded. *Petals* sub-orbicular, larger than the calyx-lobes. *Stamens* ·4 in. long. *Fruit* unknown. Kurz For. Fl. Br. Burma I, 490; Duthie in Hook. fil. Fl. Br. Ind. II, 477.

MALACCA: *Griffith* (K.D.) 2371/1: *Maingay* (K.D.) 742. DISTRIB.—Burma, *Brandis* 1337.

A species poorly represented at Kew and Calcutta: recognised by its obovate leaves, pale yellow branches, and few-flowered, pedunculate, corymbose racemes or panicles.

18. EUGENIA LEPIDOCARPA, Wall. Cat. 3618. A glabrous tree, 40 to 50 feet high: young branches greyish, terete. *Leaves* coriaceous,

ovate-oblong to broadly ovate, rarely obovate-oblong, the apex blunt with a short abrupt point, or sub-acute, the base slightly cuneate, both surfaces deep-olivaceous brown the upper somewhat shining, the lower dull: main-nerves 10 to 12 pairs, rather straight, slightly ascending and interarching with an intramarginal nerve close to the edge, not conspicuous on either surface: length 3 to 4·5 in.; breadth 1·75 to 2·75 in.; petiole 3 to 5 in. *Panicles* mostly in clusters at the apices of the branches, pedunculate, or shorter than the leaves; branchlets 4-angled, spreading, few-flowered, the flowers sessile, or nearly so, clustered at the apices, ·25 to ·3 in. in diam. *Calyx* clavate-rotund, about ·2 in. long just before expansion, vertically ribbed, tapering to the base; the lobes 4, unequal, less than ·1 in. long, broad. *Petals* rotund, larger than the calyx-lobes. *Fruit* globular-ovoid crowned by the cupular calyx, vertically ribbed, ·4 in. in diam. (unripe). Duthie in Hook. fil. Fl. Br. Ind. II, 466; Kurz in Journ. As. Soc. Beng. XLVI, Pt. 2, 68. *E. grandis*, Wight var. *lepidocarpa*, For. Fl. Br. Burma I, 490.

Singapore: *Ridley* 1643, 4633, 4657, 4972, 6307, 6308, 8408; *Wallich* 3618; *Walker; Hullet; King.* Malacca: *Griffith* 2369, 2376, 2373, 2369, 2416; *Maingay* 725, 757, 759; *Hervey; Derry.* Perak: *Wray* 415, 3907, 3914, 3908; *King's Collector* 10042. Distrib.—Burma.

A species in many respects resembling *E. grandis*, Wight, but with smaller less shining leaves with fewer nerves and broader in proportion to length: shorter panicles, smaller flowers which moreover are mostly sessile, and smaller, ribbed fruit.

19. Eugenia garcinifolia, King n. sp. A glabrous tree, 60 to 80 feet high; young branches slender, compressed, 6-ridged, brown. *Leaves* thickly coriaceous, elliptic, or elliptic-oblong, the apex with a short abrupt point, slightly narrowed to the sub-acute or rounded base, the edges recurved when dry: both surfaces (when dry) shining, conspicuously reticulate, pale-olivaceous brown, the upper rather the darker, main-nerves 10 to 12 pairs, rather prominent beneath, interarching irregularly ·2 to ·3 in. from the edge, some of the secondary nerves as prominent as the main ones; the reticulations minute but distinct; length 5 to 10 in.; breadth 2 to 3·5 in.; petiole ·2 to ·3 in. *Panicles* terminal, spreading, 3 or 4 in. across and scarcely as much long. *Flowers* probably on thick striate pedicles ·25 in. long. *Calyx* narrowly campanulate, ·5 in. long, the mouth with 4 unequal, short, rounded teeth. *Petals* orbicular. *Stamens* unknown. *Fruit* (young) globular-ovoid, crowned by the 4 triangular calyx-teeth.

Perak: *King's Collector* 4541, 6974. Sumatra: *Scortechini* 365.

A species allied to *E. densiflora*, Duthie, but with a less dense inflorescence and larger flower-buds. The leaves of this moreover are larger and thicker, the reticulations more marked and the edges recurved.

20. Eugenia crenulata, Duthie in Hook. fil. Fl. Br. Ind. II, 490. A glabrous tree: young branches as thick as a goose-quill, terete, brown. *Leaves* thickly coriaceous, elliptic or elliptic-rotund, the apex rounded but with an abrupt short apiculus, the base cuneate; both surfaces (when dry), shining, the numerous reticulations and nerves distinct, the intramarginal nerve very close to the thickened and slightly crenate edge; under surface rather remotely black-pustulate; length 4 to 5 in.; breadth 2·5 to 4 in.; petiole ·3 to ·6 in. *Panicles* terminal, nearly as long as the leaves when in bud, (sometimes longer), corymbosely trichotomus, many-flowered; the peduncle and branches 4-angled, compressed, the nodes and the insertions of the flowers with minute bracteoles. *Flowers* (including the stamens) ·4 in. long, sessile. *Petals* 4, calyptrate. *Calyx* ·2 in. long, campanulate with a truncate mouth, contracted for half its length into a pseudo-stalk. *Fruit* unknown.

Malacca: *Maingay* (K.D.) 739. Singapore: *Ridley* 6232.

Recognisable at once by its crenate leaves; only twice collected and evidently rare. The Singapore specimen has thinner leaves and more slender longer panicles but, in other respects, it agrees with the Malacca one.

21. Eugenia grandis, Wight Ill. II, 17: Ic. t. 535. A glabrous tree, 30 or 40 feet high: young branches terete, dark-brown. *Leaves* thickly coriaceous, ovate-rotund to ovate-elliptic or elliptic-oblong, the apex rounded with or without an abrupt short blunt point, or subacute or acute, the base always narrowed to the petiole: both surfaces shining; and the upper olivaceous, the lower brown when dry: main-nerves 12 to 14 pairs, curving upwards very slightly and interarching, with an intermarginal nerve ·1 to ·2 in. from the edge: the secondary nerves and lax reticulations slender but distinct like the main ones on both surfaces, length 3·5 to 7 in.; breadth 1·75 to 4 in.; petiole ·4 to ·65 in. *Panicles* mostly clustered at the apices of the branches, more than half as long as the leaves, on peduncles ·6 to 1·25 in. long; the branches spreading, an inch or more long. *Flowers* sessile at the ends of the branches, 35 to ·45 in. in diam. when expanded; the buds just before expansion clavate-rotund, ·5 in. long. *Calyx* clavate, tapered to the short pedicel, ·35 to ·5 in. long, smooth, the 4 lobes concave, orbicular, about ·2 in. long, two much larger than the others. *Petals* of the same size and shape as the calyx-lobes. *Filaments* ·35 in. long. *Ripe fruit* oblong-ovoid, 1·5 in. long, crowned by the cup-shaped calyx-limb, 1-seeded. Duthie in Hook. fil. Fl. Br. India I, 475; Kurz in Journ. As. Soc. Beng. XLVI, (1877), Pt. 2, 67; For. Fl. Brit. Burm. I, 489. *E. firma*, Wall. Cat. 3603; not of DC. *E. cymosa*, Roxb. Hort. Beng. 37; Fl. Ind. II, 492; not of Lam. *Jambosa grandis*, Blume Mus. Bot. I, 108. *J. firma*, Blume *l.c.* *J. urceolata*, Korth. in Miq. Fl. Ind. Bat. I,

Pt. 1, 418 in part. *Syzygium grande*, Walp. Repert. II, 180; not of Wall. Cat. 3554. *S. firmum*, Thwaites Enum. 417. *S. montanum*, Thwaites *l.c.* 116.

Malacca: *Griffith* (K.D.) 2368, 2369, 2370, 2371; *Maingay* 730, 723. Singapore: *Ridley* 4633; *Hullet*. Langkawi: *Curtis*. Penang: *Curtis* 7515. Distrib.—British India in Burma, Chittagong, Sylhet and Assam.

A species easily recognised by its thick glossy reticulate leaves, large (mostly) terminal panicles with large flower-buds and ovoid-cylindric smooth fruit crowned by the cup-shaped calyx-lobes.

Included under this both by Duthie in the Flora of British India and by Trimen in his Flora of Ceylon, is a Ceylon plant (Thwaites C.P. 2694 which he named *S. insigne*). This plant has quite the leaves of *E. grandis*, but the flower buds are much larger and if flowers and fruit were available it would probably turn out to be specifically distinct. *E. grandis*, Wight, is allied closely to *E. lepidocarpa*, Wall.

22. Eugenia Thumra, Roxb. var. penangiana, King. A medium-sized tree; young branches somewhat thinner than a goose-quill; the bark rough, brown. *Leaves* coriaceous, oblong-elliptic or oblong-lanceolate, sub-acute or bluntly and very shortly acuminate, the base cuneate; both surfaces dull; the upper dark leaden-brown, the nerves and midrib impressed; lower surface dark-brown, the nerves and midrib prominent; main-nerves 15 to 20 pairs, curving upwards, interarching ·1 in. from the edge; length 4 to 5 in.; breadth 1·8 to 2 in.; petiole ·3 to ·5 in. *Panicles* nearly as long as the leaves, terminal and axillary, pedunculate, lax; the branches numerous, spreading, 4-angled like the peduncle, the smaller compressed. *Flowers* ·35 in. long (including the stamens), sessile, white, crowded, 5 or 10 together at the apices of the ultimate branchlets, clavate in bud. *Calyx* funnel-shaped, narrowed for half its length into a ribbed pseudo-stalk, the mouth with 4 broad, suborbicular lobes. *Fruit* unknown.

Penang: *Curtis* 2410.

This differs from the typical *E. Thumra*, Roxb., in having narrower leaves with fewer nerves and rather shorter panicles the branches of which are more acutely 4-angled. Fruit of this is unknown: when found it may yield characters warranting the separation of this as a distinct species.

23. Eugenia Griffithii, Duthie in Hook. fil. Fl. Br. Ind. II, 481. A tree, 50 to 80 feet high; young branches thinner than a goose-quill, their bark brown and rather rough. *Leaves* coriaceous, oblong or narrowly elliptic, narrowed about equally at base and apex, both surfaces dark-brown when dry, shining; main-nerves 15 to 20 pairs, spreading, rather straight, interarching ·1 in. from the edge, depressed on the upper and prominent on the lower surface, reticulations small, indistinct; length 4·5 to 6 in.; breadth 2 to 2·5 in.; petiole ·2 to ·3 in.

Panicles small, racemose, in clusters of 6 to 8 at the apices of the branches, few-flowered, unequal in length but all shorter than the leaves and on more or less long, compressed, dark-coloured peduncles; the branches few, unequal in length but all under an inch, compressed; flowers in threes, sessile at the apices of the branchlets, the buds clavate. *Calyx* campanulate, ·25 in. long, constricted for more than half its length into a thick pseudo-stalk: the mouth with 4 broad, rounded lobes. *Petals* 4, orbicular not calyptrate. *Fruit* (unripe) globular-ovoid, slightly corrugated, crowned by the small circular remains of the calyx.

Malacca: *Griffith* (K.D.) 2375. Perak: *Wray* 2713; *King's Collector* 6192. Singapore: *Ridley* 4980, 4981, 7951.

24. Eugenia Clarkeana, King, n. sp. A tree 30 to 50 feet high; young branches as stout as a quill, terete, compressed near the nodes, brown. *Leaves* coriaceous, elliptic-oblong to elliptic, very shortly acuminate, gradually narrowed from about or below the middle to the acute base; upper surface dark-brown, shining, not reticulate, the nerves faintly impressed; lower liver-coloured, rather dull, with numerous small pustules, the 12 to 16 pairs of curved main-nerves slightly prominent, the intramarginal nerves about ·1 in. distant from the slightly recurved edge, reticulations invisible; length 4·5 to 8 in.; breadth 1·75 to 3 in.; petiole ·3 to ·35 in. *Panicles* mostly terminal, shorter than the leaves, pyramidal, with many 4-angled, often compressed branches. *Flowers* sessile, in densely crowded capitules at the apices of the branchlets, about ·35 in. across when expanded, white. *Petals* 4 or 5, free, broadly oblong, not calyptrate. *Calyx* widely campanulate, nearly ·2 in. long, constricted at the base, rugulose; its mouth with 4 broad, shallow, blunt lobes. *Fruit* globular and 1-seeded or depressed-reniform and 2-seeded, vertically corrugated when young, rugulose when ripe, shining, black, crowned by the small circular remains of the calyx; the globular form ·75 in. or more in diam., the reniform form about 1 in. long and 1·35 in. broad; pulp none.

Perak: *Scortechini* 205; *King's Collector* 3349, 3491, 3573, 6822, 7811.

Allied to *E. Griffithii*, Duthie, but with a single large terminal panicle instead of a number of small ones and with smaller flowers.

25. Eugenia corrugata, King n. sp. A tree, 30 to 60 feet high; young branches terete but compressed at the apices thinner than a goose-quill, brown. *Leaves* as in *E. Clarkeana*, but the main-nerves not depressed on the upper surface. *Panicles* terminal, short and few-branched; the branches terete. *Flowers* not seen. *Fruit* globular, much corrugated and vertically ridged, especially towards the base and

apex, depressed-globose, the rind ·25 in. thick, when fully ripe, greenish-yellow, and 2 to 3 in. in diam.

PERAK: *King's Collector* 5298, 6987.

26. EUGENIA PENDENS, Duthie in Hook. fil. Fl. Br. Ind. II, 475. A small tree with pendent branches: young branches compressed, slender, brown. *Leaves* thinly coriaceous, pellucidly dotted, narrowly oblong-elliptic or elliptic, occasionally somewhat oblanceolate, the apex shortly and rather abruptly acuminate, the base cuneate; both surfaces olivaceous when dry: main-nerves 10 to 12 pairs, slender, ascending, slightly curved, interarching ·2 in. from the margin, secondary nerves and reticulations indistinct; length 5 to 7 in.; breadth 1·4 to 3 in.; petiole ·3 to ·35 in. *Panicles* terminal, about 2 in. in diam., condensed, the branchlets about 5-flowered. *Flower-buds* globose-clavate, ·5 in. long just before expansion. *Flowers* when expanded nearly ·5 in. across. *Calyx-tube* narrowly funnel-shaped, jointed to a pedicel shorter than itself: lobes short, rounded, subequal, reflexed. *Petals* orbicular, longer than the calyx-lobes. *Stamens* ·75 in. long. *Fruit* depressed-globular, green flushed with red, smooth, crowned by the short reflexed calyx-lobes, 1 in. in diam.

MALACCA: *Griffith* 2349; *Maingay* 747; *Hervey*. JOHORE: *Ridley* 4200. SINGAPORE: *Ridley* 8048, 8447. PERAK: *Scortechini* 1809, 2021; *Wray* 3537. PENANG: *Ridley* 10242. DISTRIB.—Sumatra, *Forbes* 1377.

A species allied to *E. densiflora*, Duthie, but with leaves of thinner texture, with fewer nerves and no dots. The panicles are also much shorter, fewer-flowered, and the flowers are smaller.

27. EUGENIA BURKILLIANA, King n. sp. A tree, 40 to 60 feet high: young branches thinner than a goose-quill, brown. *Leaves* coriaceous, oblong-lanceolate, shortly acuminate, the base cuneate; both surfaces (when dry) shining, pale brownish-green, the upper pitted, the lower with black dots, the edges slightly recurved; main-nerves 10 to 14 pairs, ascending and forming wide arches ·1 to ·15 in. from the edge, between which and the actual edge is a second intramarginal nerve, the secondary nerves and connecting reticulations almost as prominent, all thin and equally visible on both surfaces, all raised: length 2·25 to 3·5 in.; breadth ·9 to 1·25 in.; petiole ·35 to ·5 in. *Panicles* terminal, sessile, many-flowered, broader than long, much branched, their tops broadly pyramidal, usually somewhat shorter than the leaves: branches thick, striate, 4-angled, slightly compressed. *Flowers* ·7 in. long including the stamens, reddish before expansion, afterwards white, sessile, in threes at the ends of the branchlets, clavate in bud. *Calyx* ·35 to ·4 in. long, striate, funnel-shaped, its lower half gradually narrowed into a

pseudo-stalk: the mouth with 4 broad, rounded, shallow lobes. *Petals* orbicular, not calyptrate. *Fruit* unknown.

PERAK: *Wray* 2785, 3070; *King's Collector* 4719, 6186.

A species near *E. oblongifolia*, Duthie, but differing in its leaves, which are of the same colour on each surface and have more distinct nerves and reticulations equally visible on both surfaces. The mouth of the calyx too is different, being deeply 4-lobed.

28. EUGENIA HELFERI, Duthie in Hook fil. Fl. Br. Ind. II, 480. A considerable tree: young branches indistinctly 4-angled, as thick as a crow-quill, with pale-brown deciduous bark. *Leaves* narrowly elliptic, tapered to each end, the apex obtusely and shortly acuminate, the base cuneate; both surfaces finely reticulate, pale olivaceous-green, the upper the darker: main-nerves about 12 pairs, faint, interarching close to the edge: the secondary nerves very faint; length 2·5 to 3·25 in.; breadth 1 to 1·25 in.; petiole ·2 in. *Panicles* terminal, solitary, spreading, about half as long or sometimes quite as long as the leaves, the branchlets spreading, their bark exfoliating. *Flowers* in threes at the ends of the branchlets, about ·5 in. across; buds clavate. *Calyx-tube* funnel-shaped, ·2 in. long, attenuated at the base to a pedicel ·2 in. long, the 4 lobes of the mouth unequal, short, broad, rounded. *Petals* broadly orbicular, much longer than the calyx-lobes and half as long as the stamens, bearing large pellucid glands on the exterior like the calyx-tube. *Fruit* unknown.

PENANG: *Curtis* 212. SINGAPORE: *Lobb.* PERAK: *King's Collector* 4181. DISTRIB.—Burma (Tenasserim) *Helfer* 2418.

Closely allied to *E. ramosissima*, Wall., but with smaller flowers.

29. EUGENIA KURZII, Duthie in Hook. fil. Fl. Br. Ind. II, 478. VAR. ANDAMANICA, King. A tree: young branches as thick as a crow-quill, terete, the bark very pale. *Leaves* thickly membranous, oblong-elliptic, the base cuneate, the apex shortly caudate-acuminate; upper surface pale-olivaceous brown when dry, shining, remotely pitted, the main-nerves faint: lower surface paler brown, not olivaceous, the 10 or 12 pairs of main-nerves rather bold, arching upwards and interarching ·15 to ·2 in. from the edge; length 4·5 to 6 in.; breadth 1·85 to 2·25 in.; petioles ·3 to ·4 in. *Panicles* from the axils of the upper leaves, or terminal, shorter than the leaves, often broader than long, spreading, many-flowered; the branches 4-angled, pale. *Flowers* mostly in threes at the ends of the branchlets, ·6 in. long (including the stamens). *Calyx* ·15 in. long; widely campanulate, narrowed into a thick pseudo-stalk as long as itself; the mouth wide, with 4 broad, rounded, reflexed teeth. *Petals* 4, free, sub-orbicular, reflexed. *Stamens* four times as long as the calyx. *Fruit* unknown.

Andaman Islands, at Hobdaypore; *King's Collector.*

This differs from typical *E. Kurzii* in having narrower more acuminate leaves and longer stamens. The young branches moreover have paler bark. Fruit is as yet unknown, but when found it may afford characters to warrant specific rank for this.

30. Eugenia anisosepala, Duthie in Hook. fil. Fl. Br. Ind. II, 481. A large tree: young branches terete, thinner than a goose-quill, brown, smooth. *Leaves* coriaceous, ovate to ovate-lanceolate, shortly acuminate, the base cuneate, both surfaces (when dry) dark-brown, the upper shining and with the nerves rather faint; the lower paler brown, the 12 to 14 pairs of curved main-nerves rather distinct, interarching ·1 in. from the edge, the secondary nerves somewhat distinct; length 2·5 to 3·5 in.; breadth 1 to 1·75 in.; petiole ·2 to ·25 in. *Panicles* terminal, corymbose, usually shorter than the leaves, the branches numerous, spreading, rather crowded, 4-angled, the peduncle compressed. *Flowers* ·5 in. long (including the stamens), sessile, clavate in bud, in threes at the apices of the branchlets. *Calyx* ·3 in. long, campanulate-infundibuliform, its lower half contracted into a pseudo-stalk; the limb with 4 unequal, broad, rounded lobes (two being larger and sub-petaloid). *Petals* 4; not calyptrate. *Fruit* unknown. *E. anisosepala*, Duthie in Hook. fil. Fl. Br. Ind. II, 481 in part.

Malacca: *Griffith* (K.D.) 2380, 2381. *Maingay* (K.D.) 754, 753 (in part). Malacca: *Derry* 289.

Mr. Duthie remarks that the Griffithian specimens above quoted differ somewhat from those of Maingay inasmuch as they have smaller flowers. With these Mr. Derry's single specimen agrees. Maingay's specimens have a much larger more spreading panicle, with smaller flowers. The material is very poor and I think it is likely that, when more is forthcoming, it will be found that two species are mixed under the name *E. anisosepala*, Duthie.

31. Eugenia Gageana, King n. sp. A tree, 40 to 50 feet high: young branches thinner than a goose-quill, terete, compressed at the nodes, brown (when dry). *Leaves* thickly coriaceous, oblong-lanceolate, bluntly acuminate, the base cuneate; upper surface dull-brown, the midrib thin and depressed, the main-nerves faint: lower surface paler brown, the midrib thick and the reticulations and secondary nerves numerous and distinct; the main-nerves 12 to 18 pairs, curving upwards and interarching ·1 in. from the edge: length 5 or 6 in.; breadth 1·5 to 2·25 in.; petiole ·25 to ·3 in. *Panicles* terminal, about half as long as the leaves, sessile, corymbose, many-flowered, branching from the base; branches stout, spreading, obtusely 4-angled. *Flowers* sessile, in threes at the apices of the branchlets, globose-clavate in bud. *Calyx* narrowly campanulate, rather abruptly narrowed into a pseudo-stalk about ·05 in. in length. *Fruit* unknown.

Perak: *King's Collector* 7563.

32. Eugenia Hulletiana, King n. sp. A tree, 20 to 25 feet high; young branches thicker than a crow-quill, terete, brown. *Leaves* thinly coriaceous, elliptic or elliptic-ovate, with an abrupt, broad, short, apical acumen, the base cuneate, the edge slightly recurved; upper surface somewhat shining, dull-olivaceous; the lower tinged with brown; main-nerves numerous, about ·1 in. apart, rather straight, curving upwards at the ends only and there interarching less than ·05 in. from the edge, faint on the upper surface and only slightly conspicuous on the lower, the midrib depressed on the upper surface convex on the lower: reticulations almost invisible on the upper, not prominent on the lower surface; length 3·25 to 4·5 in.; breadth 1·5 to 2 in.; petiole ·3 to ·4 in. *Panicles* axillary and terminal, as long or nearly as long as the leaves, rather lax, pedunculate; the branches few, spreading, 4-angled, compressed. *Flowers* pale-green, (the stamens white), in groups of three, sessile at the ends of the branches, about ·5 or ·6 in. long (including the stamens), clavate in bud. *Calyx* about ·25 in. long, funnel-shaped, the lower two-thirds cylindric and vertically ribbed; the mouth wide, divided into four broad, rounded lobes. *Petals* 4 sub-orbicular, reflexed, free. *Fruit* unknown.

Perak: *King's Collector* 7470. Distrib.—Sumatra, *Ridley* 8973.

A species resembling in many respects *E. glauca*, King, but with larger flowers and differently veined leaves.

33. Eugenia chlorantha, Duthie in Hook. fil. Fl. Br. Ind. II, 487. A small glabrous tree: young branches thin, dark-brown, sub-terete. *Leaves* coriaceous, elliptic or ovate-elliptic, the apex shortly and abruptly acuminate, the base cuneate, both surfaces olivaceous-green when dry: main-nerves numerous, interarching less than ·1 in. from the edge, thin but distinct, the secondary nerves and reticulations also distinct: length 4·5 to 6 in.; breadth 2 to 3 in.; petiole ·3 to ·35 in. *Panicles* much shorter than the leaves, axillary and terminal, divaricate, many-flowered, condensed, trichotomous, the branchlets compressed, 4-angled, short. *Flowers* ·3 in. in diam. (excluding the stamens), sessile, clavate. *Calyx* ·35 in. long, contracted into a thick, ridged pseudo-stalk for more than half its length, the mouth with 4 short thick, broad, rounded, spreading or reflexed lobes. *Petals* orbicular, greenish, not calyptrate. *Fruit* sub-globular, smooth, crowned by the prominent reflexed or spreading calyx-teeth, ·3 to ·4 in. in diam.

Malacca: *Griffith* (K.D.) 2385; *Maingay* (K.D.) 733. Singapore: *Ridley* 445, 3910, 5823, 9220. Pahang: *Ridley* 1096. Penang: *Curtis* 180, 1448; *Ridley* 7957, 7952, 10190. Johore: *Ridley* 9181. Perak: *King's Collector* 1277, 4082, 4220, 4076, 6765, 5619, 7511, 8535. Distrib—Sumatra, *Forbes* 3098.

Although the petals of this are greenish, the stamens are of a brilliant red colour and as these are more permanent than the petals the specific name is somewhat misleading. There are however some specimens in which the petals are distinctly stated by the collector to be red.

In the Herbarium the species is readily recognised by the large persistent spreading calyx-lobes which crown the fruit and by the greenish colour of the leaves.

34. Eugenia penangiana, Duthie in Hook. fil. Fl. Br. Ind. II, 486. A slender glabrous tree, 40 to 80 feet high: young branches sub-terete, ribbed, those of the inflorescence 4-angled, all pale when dry. *Leaves* coriaceous, lanceolate or oblong-lanceolate rarely oblanceolate, obtusely acuminate, the base cuneate; both surfaces yellowish when dry, the lower slightly paler; nerves numerous spreading not prominent on either surface; length 2 to 3 in. rarely 4 in.; breadth ·75 to 1·75 in.; petiole ·1 to ·15 in. *Panicles* mostly terminal, but a few axillary, 1 to 3 in. long, on slender peduncles, the branchlets numerous divaricate, each bearing at its apex 3 to 5 sessile, white, clavate flowers ·5 or ·6 in. long. *Calyx* about ·4 in. long (longer in fruit), funnel-shaped, abruptly tapering to the base, ribbed (when dry), the limb with 4 or 5 short often obscure teeth. *Petals* orbicular, equal in number to the calyx-lobes, free. *Stamens* short. *Fruit* elongate, gradually tapered to the base from the truncate apex, crowned by the cupular, entire calyx-limb, ·5 or ·6 in. long.

Penang: *Maingay* (K.D.) 744; *Curtis* 193, 2790, 2972. Perak: *Scortechini* 132, 184, 1368, 3410, 5651, 6965; *Wray* 3066. Malacca: *Derry* 1177.

It is possible that two species may be covered by the preceding description as some of the specimens have smaller thinner leaves and flowers with more constricted pseudo-stalks than the type specimen (*Maingay* 744) on which Mr. Duthie founded the species.

35. Eugenia Ridleyi, King n. sp. A tree; young branches thinner than a goose-quill, terete, the bark brown, rather rough. *Leaves* thinly coriaceous, oblong- or ovate-lanceolate, acute, or acuminate, the base cuneate; both surfaces rather dull when dry, the upper dark olivaceous brown, the nerves impressed; the lower pale warm brown, the midrib and nerves very prominent; main-nerves 7 to 10 pairs, curving upwards and interarching far from the edge, the secondary nerves prominent but the reticulations obscure; length 3·5 to 4·5 in.; breadth 1·25 to 2 in.; petiole ·4 to ·5 in. *Panicles* axillary and terminal, half as long as the leaves, the terminal sometimes as long, broad, the branches few and spreading horizontally, compressed especially at the nodes. *Flowers* ·3 in. long (including the stamens), green, sessile, the buds clavate; *calyx* ·2 in. long, campanulate above, abruptly narrowed

for half its length into a minutely granular pseudo-stalk; the mouth with 4 large, rounded lobes. *Petals* not calyptrate, three times as long as the calyx-lobes, ovate-rotund and like the latter reflexed in flower. *Fruit* unknown.

SINGAPORE: (in the "garden jungle"), *Ridley* 3706, 6416, 6419, 5728, 6233. PENANG: *Curtis* 3010.

Notable for its green flowers.

36. EUGENIA PYRIFOLIA, Duthie in Hook. fil. Fl. Br. Ind. II, 487. A tree 20 to 40 feet high; young branches thicker than a crow-quill, pale, terete (the very youngest 4-angled), brownish-white. *Leaves* coriaceous, elliptic-oblong or oblong-lanceolate, occasionally obovate-elliptic, shortly and rather bluntly cuspidate, or cordate-acuminate, the base cuneate; upper surface (when dry) dark olivaceous-brown, shining, the main and secondary nerves and also the midrib depressed, the latter prominent, the former faint; lower surface paler and duller than the upper and the nerves and reticulations rather more prominent, the midrib bold and convex, the former faint; lower surface paler and duller than the upper; length 2·5 to 4 in.; breadth 1 to 1·75 in.; petiole ·25 to ·35 in. *Panicles* axillary and terminal, shorter or longer than the leaves, laxly branched, corymbose or pyramidal, many-flowered, the branches spreading, slender, acutely 4-angled, bracteoles at the bases of the branches and at the bases of the flowers minute, subulate, deciduous. *Flowers* white, ·4 in. long (including the calyx), clavate in bud, sessile in groups of two, three or more at the ends of the branchlets; *calyx* slightly over ·2 in. in length, funnel-shaped, vertically striate, the mouth with 4 broad, shallow, rounded teeth. *Petals* reniform-orbicular or orbicular, dotted outside, free. *Fruit* depressed-globular, crowned by the narrow tubular remains of the calyx, not pulpy, ·75 in. in diam. when ripe. *E. tumida*, Duthie *l.c.* 487. *Syzygium pyrifolium*, Wall. Cat. 3584; DC. Prodr. III, 261 (Syzyg.); Korth. in Ned. Kruidk. I, 204; Miq. Fl. Ind. Bat. I, Pt. 1, 457. *Calyptranthes pyrifolia*, Blume Bijdr. 1090.

In all the provinces except the Andaman and Nicobar Islands: common.

37. EUGENIA LINEATA, Duthie in Hook. fil. Fl. Br. Ind. II, 487. A tree 30 to 60 feet high; young branches thicker than a crow-quill, terete, their bark pale-brown. *Leaves* thinly coriaceous, ovate-lanceolate or narrowly elliptic, rather abruptly and shortly acuminate, the base cuneate; upper surface (when dry) olivaceous-brown, shining, sometimes minutely pitted; the nerves numerous, indistinct, the midrib depressed; lower pale-brown, not olivaceous, the main-nerves more distinct than on the upper, close together, the neighbouring ones

connected throughout their whole length by curving loops; length 2·75 to ·4 in.; breadth 1·1 to 1·75 in.; petioles ·25 to ·35 in. *Panicles* terminal and from the upper leaf-axils, shortly pedunculate, lax, longer than the leaves; branches numerous divaricate, 4-angled, the younger also compressed. *Flowers* ·4 or ·5 in. long (including the stamens), sessile in twos or threes at the apices of the branchlets, the buds clavate. *Calyx* narrowly funnel-shaped, gradually tapering to the base, striate; the mouth with 4 rather deep, broad, rounded, concave lobes. *Petals* 4, orbicular, reflexed. *Fruit* ovoid, crowned by the thick, short, wide, 4-toothed calyx, black and shining when ripe, one-seeded, not pulpy, ·3 in. long and ·2 in. in diam. *E. corymbosa*, Wall. Cat. 3566 F. *Jambosa lineata*, DC. Prod. III, 287; Miq. Fl. Ind. Bat. I, Pt. 1, 428. *Clavimyrtus lineatus*, Blume Mus. Bot. I, 116. *Myrtus lineata*, Blume Bijdr. 1087.

In all the provinces except the Nicobar and Andaman Islands: common. DISTRIB.—The Malayan Archipelago.

A widely distributed species and varying as to size of leaf and also of flower-bud. In some specimens some of the nerves are of a dark colour on the lower surface. This is often confused with *E. rubricunlis*, Miq., which is itself a somewhat doubtful species.

38. EUGENIA CYMOSA, Lamk. Dict. III, 109 (*not of Roxb.*). A shrub or small tree; young branches as thick as a crow-quill, terete, pale. *Leaves* thinly coriaceous, ovate, ovate-lanceolate, (narrowly oblong-lanceolate in VAR. *concinna*), caudate-acuminate, the base cuneate; both surfaces when dry brown, the upper tinged with olivaceous, the numerous nerves and reticulations distinct on the lower less so on the upper; length 2 to 3 in.; breadth 1 to 1·5 in.; petiole ·15 to ·3 in. *Panicles* numerous, axillary and terminal, an inch or two in length, the terminal twice as long, lax, the branches few, spreading, slender, compressed, with 3 or 4 flowers at their apices. *Flowers* sessile, white, ·35 in. long (including the stamens). *Calyx* campanulate, abruptly contracted into a pseudo-stalk, the mouth with 4 small triangular lobes. *Petals* 4, orbicular, free. *Fruit* almost globular, the size of a pea, blueish-black, pulpy, 1- or 2-seeded, (if 2-seeded transversely oblong in shape). Wight Ill. II, 17; Ic. t. 555; Kurz in Journ. As. Soc. Beng. XLVI, Pt. 2, 67; For. Fl. I, 486. Duthie in Hook. fil. Fl. Br. Ind. II, 482. *Syz. caudatum*, Wall. Cat. 3591. *S. vimineum*, Wall. Cat. 3533 ?. *S. concinnum*, Wall. Cat. 3582. *S. nelitricarpum*, T. & B. in. Nat. Tidsch. Ned. Ind. XXV. *S. cymosum*, DC. Prodr. III, 259; Korth. in Ned. Kruidk. Arch. I, 202 ?. *E. nigrescens*, Poir. Suppl. III, 123 ?. *E. rhodomelea*, Commers. in DC. Prodr. *l.c.* *Jambosa tenuicuspis*, Miq. Fl. Ind. Bat. I, 431. *Myrtus cymosa*, Spreng.; Blume Bijdr. 1086.

In all the provinces. DISTRIB.—Burma, Sylhet and Assam, Java.

VAR. *concinna* (sp. Wall.); leaves narrowly oblong-lanceolate, caudate-acuminate.

PERAK: *King's Collector* 10521. DISTRIB.—Burma, *Wallich* 3582.

39. EUGENIA CONGLOMERATA, Duthie in Hook. fil. Fl. Br. Ind. II, 497. A large tree; young branches thinner than a goose-quill, obscurely 4-angled, blackish-brown, smooth: the older terete, grey, striate. *Leaves* coriaceous, oblanceolate, sub-acute or blunt, much tapered to the base: upper surface (when dry) blackish-brown, shining; the lower liver-coloured, somewhat dull, minutely black-dotted; main-nerves 18 to 20 pairs, spreading, curved, faint, more distinct on the upper than on the under surface, the midrib stout on the lower surface, the edges slightly recurved; length 3 to 4·5 in.; breadth ·8 to 1·75 in.; petiole ·2 to ·35 in. *Inflorescences* generally 2 or 3 together from small tubercles on the naked branches below the leaves, consisting usually of few-flowered capitula on short peduncles from ·25 to ·5 in. long, or of solitary flowers from the bases of the peduncles. *Flowers* small, sub-globular or campanulate, only about ·1 or ·15 in. long, sessile. *Calyx* widely campanulate; the limb with 4 rounded lobes. *Petals* 4, free. *Fruit* pisiform, smooth, crowned by the 4 calyx-lobes and also by the stamens, red, smooth.

MALACCA: *Maingay* (K.D.) 745. SINGAPORE: (near the Botanic Garden), *Ridley* 5073.

40. EUGENIA URCEOLATA, King. A tree, 30 to 60 feet high: young branches rather thinner than a goose-quill, 4-angled, with pale brownish-yellow, striate bark. *Leaves* coriaceous, elliptic-oblong, elliptic, or obovate-elliptic, shortly and bluntly acuminate, the base cuneate; upper surface (when dry) dark-brown, shining, pellucid-dotted; the lower warm-brown, with black dots: main-nerves 12 to 18 pairs, curving upwards and interarching ·1 in. or more from the edge; length 5 to 7 in.; breadth 2 to 3·25 in.; petioles ·25 in. long. *Flowers* from small axillary tubercles, solitary, fasciculate or in small panicles, (often several from one axil), much shorter than the leaves and with a few (usually about 3) very short, slender, spreading, 4-angled branches powdered with ferrugineous scurf. *Flowers* about ·35 in. across (including the stamens). *Calyx* an open, rotate cup on a short, thin stalk, the margin divided into 4 broad, sub-orbicular, blunt, spreading, concave lobes. *Petals* 4, orbicular, free, spreading. *Fruit* turbinate, about ·5 in. in diam., crowned by the short calyx-limb. *Jambosa urceolata*, Korth. in Ned. Kruidk. Arch. I, (1847), 202; Miq. Fl. Ind. Bat. I, Pt. 1, 418 (excluding all the synonyms).

PERAK: *Wray* 2423, 2609, 2928, 3134, 3248; *King's Collector* 1908, 2317, 713, 3345, 4262, 6665, 6682, 6600, 10677, 10780. SELANGOR:

Ridley 7336. SINGAPORE: *Ridley* 256, 4975. MALACCA: *Ridley*. DISTRIB. —Sumatra.

The rotate 4-lobed calyx distinguishes this species.

41. EUGENIA GLAUCA, King n. sp. A tree, 40 to 50 feet high; young branches somewhat thicker than a crow-quill, terete; the bark pale-brown and flaky. *Leaves* coriaceous, oblong- or ovate-lanceolate, often obovate-lanceolate, sub-acute or blunt and with a short blunt point; upper surface (when dry) olivaceous-brown and shining, the lower glaucous (not glaucous in VAR.); the numerous nerves and reticulations very distinct on both surfaces, edge slightly recurved, (not recurved in VAR.) the intramarginal nerve very close to it; length 2·25 to 4 in.; breadth 1 to 2 in.; petiole ·25 to ·3 in. *Flowers* few, sessile, ·3 in. long (including the stamens) and as much wide, in racemes or small, few-branched, axillary or terminal panicles 3 or 4 inches long (often several together), with compressed, 4-angled rachises. *Calyx-limb*, a wide shallow cup with 4 broad, shallow, deciduous lobes, afterwards truncate-erose, below narrowed into a thin pseudo-stalk. *Petals* 4, orbicular, clawed, free, reflexed. *Fruit* unknown.

PENANG: *Curtis* 1152, 2228. PERAK: *Ridley* 3086. MALACCA: *Derry* 1184.

Distinguished by its much reticulate leaves glaucous beneath and its few-flowered inflorescence.

VAR. *pseudo-glauca*, King; like the type but with thinner narrower and more acute leaves with no tendency to be obovate, not glaucous beneath and the edges not recurved.

PERAK: *Ridley* 3108, 8386. The Dindings; *Curtis* 3440.

42. EUGENIA SUBRUFA, King n. sp. A tree, 20 to 30 feet high: young branches half as thick as a goose-quill, terete, grey or pale-brown after the defoliation of the thin, flaky, brown bark. *Leaves* thickly coriaceous, narrowly elliptic or elliptic-ovate, shortly acuminate, the base cuneate; upper surface (when dry) pale olivaceous-brown slightly shining, the midrib, nerves and reticulations depressed; lower reddish, dull, the midrib and nerves prominent: main-nerves about 8 pairs, curving upwards, interarching at less than ·1 in. from the edge to form a somewhat faint intramarginal line, the edges recurved; length 3·5 to 5 in.; breadth 1·5 to 2 in.; petiole ·3 to ·4 in. *Panicles* terminal and axillary, pedunculate, the few branches very short and crowded at the apex of the peduncle; both peduncle and branches 4-angled. *Flowers* ·5 in. long (including the stamens), sessile, in threes at the apices of the very short (·1 in. long) branches, clavate-obovoid in bud. *Calyx* campanulate, funnel-shaped, reduced for a third of its length to a

stout, wrinkled pseudo-stalk: the mouth undulate and with 4 broad shallow deciduous teeth. *Fruit* ovoid, smooth, crowned by the wide circular remains of the calyx, ·4 in. long (unripe) and ·35 in. in diam.

SINGAPORE: *Ridley* 4588. PENANG: *Curtis* 194.

VAR. *robusta*, King; *leaves* larger (3·5 to 5·5 long and 1·5 to 2·2 in. broad) than in the typical form, and young branches thicker. *Panicles* several, terminal, 2 to 2·5 in. long; the branches more numerous than in the type form and not crowded at the apex, the lower as much as ·4 in. long.

PENANG: *Curtis* 194, 1448, 3275.

A very rare but distinct species readily recognised by its short panicles, comparatively large flowers, and by the boldness of the midrib and of the few nerves on the under surface of the leaves which when dry are of a conspicuous terra-cotta colour.

43. EUGENIA DUTHIEANA, King n. sp. A tree, 40 to 70 feet high young branches thicker than a crow-quill, the bark brown, rather rough. *Leaves* coriaceous, elliptic, ovate-elliptic or lanceolate-elliptic, shortly acuminate, the base cuneate; both surfaces brown when dry and rather dull, the lower slightly the paler; main-nerves 4 to 8 pairs, curved, ascending, interarching far from the edge (about ·15 in.), impressed on the upper, faintly prominent on the lower surface; the secondary nerves almost as prominent as the main ones; the reticulations indistinct on the lower, invisible on the upper surface; length 3 to 5 in.; breadth 1·25 to 2·25 in.; petiole ·15 to ·2 in. *Racemes* slender, 1 to 2 inches long, slender, solitary, clustered, terminal or axillary, the rachis dark, 4-angled. *Flowers* few, sessile, clavate in bud, sometimes clustered at the apex of the rachis. *Calyx* ·2 in. long, funnel-shaped, half of it contracted into a pseudo-stalk, the mouth wide and with 4 broad, rounded teeth. *Petals* reflexed, orbicular, white. *Fruit* clavate when young, becoming almost globular when ripe, rugulose, crowned by the wide circular remains of the calyx, ·75 in. long and ·65 in. in diam.

PERAK: *King's Collector* 3966, 4218, 6268; *Scortechini*. MALACCA *Derry* 256. PENANG: *Curtis* 653. SINGAPORE: *Ridley* 3864, 4982, 8400.

A species resembling *E. minutiflora*, Miq., but with larger flowers and more numerously nerved leaves. It is named after Mr. J. F. Duthie, F.L.S., who elaborated the *Myrtaceæ* for Hooker's Flora of British India.

44. EUGENIA POLYANTHA, Wight Ill. 17; Icones 543. A tall, slender tree; young branches rather thicker than a crow-quill, brown. *Leaves* thinly coriaceous, narrowly elliptic or lanceolate, sometimes oblong-oblanceolate, shortly and bluntly acuminate, the base cuneate: upper surface (when dry) dark-brown, shining, the nerves scarcely visible; lower paler brown, dull, with numerous minute black dots; main-nerves

8 to 10 pairs, spreading, slightly curved upwards at the ends and interarching less than ·1 in. from the edge, slightly prominent on the lower surface: length 3 to 4·5 in.; breadth 1 to 1·5 in.; petiole ·2 to ·3 in. *Panicles* numerous, from the young branches below the leaves, or rarely axillary, 1 to 1·5 in. long; the rachis and short divaricate branches slender, compressed, 4-angled. *Flowers* at the ends of the branchlets, usually in threes, white, sessile. *Petals* 4, orbicular, free. *Calyx* a little more than ·1 in. long, campanulate, constricted for one-third of its length into a pseudo-stalk, rugulose, shining: the mouth with 4 deep, rounded lobes. *Fruit* much depressed-globular if one-seeded, broader than long if two-seeded, always much depressed and crowned by the circular remains of the calyx, black, hard, without pulp, ·15 in. long and of the same width if globular, and more than twice as broad if 2-seeded. Duthie in Hook. fil. Fl. Br. Ind. II, 496. *E. nitida*, Duthie *l.c.* *E. lucidula*, Miq. Fl. Ind. Bat. I, Pt. 1, 444. *? Myrtus cymosa*, Bl. Bijdr. 1086.

In all the provinces, except the Nicobars and Andamans: common. DISTRIB.—Malay Archipelago, Burma.

45. EUGENIA MANII, King n. sp. A tree, 20 to 30 feet high: young branches about as thick as a crow-quill, pale-brown, terete. *Leaves* membranous, elliptic to ovate-elliptic, the apex acuminate, the base cuneate; both surfaces brown when dry, the lower much paler than the upper and with numerous small black dots; main-nerves 5 or 6 pairs, curved, ascending, interarching ·1 to ·15 in. from the edge; reticulations large, indistinct on the lower and invisible on the upper surface; length 3·5 to 4·5 in.; breadth 1·5 to 2 in.; petiole ·2 to ·4 in. *Panicles* mostly shorter than the leaves, crowded, from the axils of leaves and of fallen leaves, usually shorter than the leaves, the branches few and slender (one often from the very base), compressed. *Flowers* clustered at the apices of the filiform branchlets, often numerous and crowded, sometimes few, whitish-red in colour, globular in bud. *Calyx* ·15 in. long, campanulate, abruptly contracted into a short pseudo-stalk; the mouth with 4 deep, ovate-rotund lobes. *Petals* 4, rotund, slightly longer than the calyx-lobes, free, not calyptrate. *Fruit* depressed-globular, minutely rugulose, crowned by the small circular remains of the calyx, 4 in. broad and slightly less from base to apex.

ANDAMAN ISLANDS: *King's Collectors.*

Named in honour of Mr. E. H. Man, C.I.E., Deputy Commissioner of the Andamans, who has for years given most cordial help in the botanical exploration of the Andaman and Nicobar groups. A species related to *E. polyantha*, Wight, but with larger fewer-nerved leaves, and rather longer flowers and fruit. Also near *E. operculata*, Roxb.

46. EUGENIA CAUDATA, King. A glabrous bush or small tree; young branches very slender, sub-terete, the bark pale-grey or brown. *Leaves* thinly coriaceous, lanceolate or ovate-lanceolate, caudate-acuminate, the base cuneate; both surfaces pale-brown when dry, the lower palest; nerves numerous, spreading, scarcely visible; length 1·75 to ·3 in.; breadth ·75 to 1·1 in.; petiole ·15 to ·3 in. *Racemes* on slender peduncles, axillary or terminal, shorter than the leaves, laxly 3- to 5-flowered. *Flowers* ·25 in. across, on slender pedicels ·1 to ·2 in. long, (longer in fruit). *Calyx* ·2 in. long, campanulate, contracted at the very base into a very short pseudo-stalk (less than a quarter of its length), the mouth with 4 short, broad, blunt, deciduous teeth. *Petals* orbicular, about twice as long as the short stamens, deciduous. *Fruit* at first ovoid, afterwards nearly globular, ·5 in. long, smooth, crowned by the cupular, short, 4-toothed calyx-limb. *Myrtus caudata*, Wall. Cat. 3631.

SINGAPORE: *Wallich.* PENANG: *Curtis* 654. PERAK: *Curtis* 2007; *Scortechini* 392, 444; *King's Collector* 3654, 4241, 6262; *Wray* 472, 1176, 1574, 2824, 3208, 5341.

A species rather easily recognised by its small caudate-acuminate, lanceolate, indistinctly-nerved leaves and few-flowered, lax racemes Wallich also issued under his No. 3591 a plant to which he gave the name *Syzygium caudatum*. It differs much from this and is in fact *Eugenia cymosa*, Lamk.

47. EUGENIA FILIFORMIS, Wall. Cat 3578. A glabrous tree, 30 to 50 feet high, with slender drooping branches: young branches very slender, terete, dark-coloured. *Leaves* coriaceous, small, pellucid-dotted, lanceolate or ovate-lanceolate, shortly caudate-acuminate, the base cuneate: both surfaces greenish-brown when dry: the nerves numerous, a few slightly conspicuous, the others very faint; length 1·75 to 3 in.; breadth ·75 to 1·2 in.; petiole ·15 to ·2 in. slender. *Racemes* slender, very lax, few-flowered, axillary and terminal, as long as or longer than the leaves. *Flowers* ·75 in. long including the stamens, inserted on the slender rachis by filiform pedicels ·75 to 1·25 in. in length. *Calyx* funnel-shaped, attenuated for half its length into a slender pseudo-stalk; the limb with 4 broad, blunt, reflexed lobes nearly ·1 in. long. *Petals* orbicular-reniform, reflexed, ·25 in. long. *Ripe fruit* elliptic-ovoid to sub-globular, smooth, ·75 in. long, crowned by the calyx-lobes. Duthie in Hook. fil. Fl. Br. Ind. II. 478. *Syzygium filiforme* and *S. capillare*, Wall. Cat. 3580 and 3578. *Clavimyrtus virens*, Blume Mus. Bot. Lugd. Bat. I, 114.

SINGAPORE: *Wallich; Hullett; Ridley* 4569. PENANG: *Wallich; Curtis* 1090, 1443. MALACCA: *Griffith* (K.D.) 2389; *Maingay* (K.D.) 721; *Derry* 451, 471. PERAK: *King's Collector* 2321, 5601, 5861, 5925, 6708; *Wray* 1192, 3262; *Ridley* 9640.

48. Eugenia andamanica, King n. sp. A small glabrous tree: young branches slender, with greyish-brown rather rough bark. *Leaves* coriaceous, rotund-ovate to rotund, with a very short abrupt blunt apiculus, obscurely crenate near the apex, abruptly tapered to the base; nerves numerous invisible on the upper shining surface and faint on the dull lower surface, curving upward, interarching close to the margin; length 1·5 to 2·5 in.; breadth 1 to 2 in.; petiole ·3 or ·4 in. *Panicles* often as long as the leaves, crowded, pedunculate, axillary and terminal, the branchlets usually trichotomous, 4-angled, bearing 3 or 4 sessile flowers at their apices. *Flowers* about ·5 in. long, clavate, the calyx contracted into a pseudo-stalk more than half of its length, the mouth with 4 erect, equal, triangular, acute teeth. *Petals* 4, orbicular, calyptrate. *Fruit* unknown.

Andaman Islands: *King's Collector.*

49. Eugenia Hoseana, King n. sp. A glabrous tree, 30 to 40 feet high: young branches thinner than a goose-quill, pale greyish-yellow, terete, the very youngest quadrangular. *Leaves* coriaceous, elliptic to elliptic-oblong, abruptly and shortly caudate-acuminate, the base cuneate; upper surface dark-brown leaden and shining when dry, the lower pale-brown and dull; main-nerves 15 to 20 pairs ascending very little, almost straight, interarching ·1 in. from the edge; length 4·5 to 7 in.; breadth 1·75 to 2·5 in.; petiole ·15 to ·3 in. *Racemes* axillary and terminal, solitary, not more than 1 in. long, the rachis with 2 deep grooves. *Flowers* white, ·35 in. long, exclusive of the stamens, sessile, enveloped in several sub-ovate leathery bracts as long as themselves. *Calyx-tube* widely campanulate, contracted slightly at the base but not into a pseudo-stalk; its texture very leathery; its mouth with 4 blunt, obtuse lobes. *Petals* orbicular. *Fruit* unknown.

Perak: *Scortechini* 163; *Wray* 2952; *King's Collector* 3407.

50. Eugenia Benjamina, King n. sp. A glabrous shrub or small tree: young branches thin, terete, pale-brown. *Leaves* thinly coriaceous, conspicuously pellucid-dotted on both surfaces, narrowly elliptic, sometimes oblanceolate-elliptic, with an abrupt, narrow, short apiculus half an inch or more in length, the base cuneate: both surfaces pale yellowish- or greenish-brown when dry; the nerves very numerous, distinct like the reticulations, interarching near the margin; length 2·5 to 3 in.; breadth 1 to 1·5 in.; petiole ·15 in. slender. *Racemes* axillary or terminal, shorter than the leaves, few-flowered. *Flowers* ·5 to ·6 in. long, (including the stamens), sessile on short stout pedicels. *Calyx* clavate, the mouth with 4 broad, blunt lobes. *Petals* orbicular, with thin edges. *Fruit* when young covered with large convex pellucid glands, crowned by the deeply 4-lobed calyx-limb; when ripe depressed-globular, the calyx-limb reduced to a ring, 1 in. long and 1 to 1·4 in. broad.

PERAK: *Wray* 2623, 2797, 3204; *King's Collector* 7306. DISTRIB.—Sumatra, *Forbes* 2046.

Named from the resemblance of its leaves to those of *Ficus Benjamina*, Linn. The Perak specimens have no ripe fruit on them and the description of it above given is taken from Forbes's Sumatra specimens which agree in leaf absolutely with those collected in Perak.

51. EUGENIA VARIOLOSA, King n. sp. A glabrous shrub, 12 to 20 feet high: young branches slender, 4-angled, pale-brown, profusely dotted, like the leaves on both surfaces and the flowers, with large pellucid glands. *Leaves* thinly coriaceous, oblong-lanceolate, rarely elliptic-oblong, caudate-acuminate, the base cuneate; both surfaces when dry pale-brown; main-nerves 12 to 15 pairs slightly prominent on the lower surface (when dry), ascending, rather straight, interarching ·1 to ·15 in. from the margin, secondary nerves and reticulations indistinct: length 5·5 to 7 in.; breadth 1·35 to 2·5 in.; petiole ·2 to ·3 in. *Racemes* axillary and terminal, crowded, only about 1 in. long. *Flowers* white, ·4 in. across, on stout pedicels less than ·1 in. long. *Calyx-tube* narrowly campanulate, ·2 in. long, the mouth with two very unequal pairs of rounded teeth. *Petals* orbicular, thick in the centre, much shorter than the stamens. *Style* about ·5 in. long. *Fruit* globular: smooth, prominently glandular-dotted, crowned by the short calyx, ·8 in. in diam.

PERAK: *Scortechini; King's Collector* 3415, 3995, 6036, 10437. SINGAPORE: *Ridley* 8411, 8449. SELANGOR: *Ridley* 4973.

Distinguished by having prominent pustule-like glands on all its parts.

52. EUGENIA CLAVIFLORA, Roxb. Hort. Beng. 37; Fl. Br. Ind. II, 488. A glabrous tree, 25 to 30 feet high: young branches slender, pale-brown, compressed. *Leaves* thinly coriaceous, lanceolate or oblong-lanceolate, shortly acuminate, the base acute; main and secondary nerves very numerous, curving upwards and interarching less than ·1 in. from the edge: length 4 to 6 in.; breadth 1·5 to 2 in.; petiole ·1 to ·15 in. *Flowers* ·6 to ·8 in. long, in very shortly stalked, condensed, axillary corymbs, sessile; the calyx-tube narrowly cylindric-clavate, contracted at the base into a slender pseudo-stalk; the mouth with 4 or 5 short, broad lobes. *Petals* 4 or 5, free, white, orbicular-ovate, about ·25 in. long; filaments about ·6 in. long. *Fruit* narrowly oblong-ovoid, about ·8 in. long, smooth, pulpy, crowned by the short, incurved calyx-limb, 1-seeded. Duthie in Hook. fil. Fl. Br. Ind. II, 484; Wight Ill., II, 15; Ic. t. 606; Kurz in Journ. As. Soc. Beng. XLVI, Pt. 2. 65; For. Fl. I, 480. *Syzygium claviflorum*, Wall. Cat. 3575. *S. longiflorum*, Wall. Cat. 3572. *S. excavatum*, Wall. Cat. 3574. Wall. Cat. *Indeterminata* 8085.

Nicobar and Andaman Islands; common. Distrib.—British India in Burma, Chittagong and Assam.

var. *leptantha;* flowers and fruit smaller than in the typical form: flowers in short racemes, not in corymbs: fruit ·4 in. long. Duthie in Hook. fil. Fl. Br. Ind. II, 484; Benth. Fl. Austral. III, 283 (*Syz.*); Kurz in Journ. As. Soc. Beng. XLVI, Pt. 2, 65; For. Fl. I, 480. *S. suavissimum*, Wall. Cat. 3573. *Syzyg.* Griff. Notul. 654.

Malacca: *Griffith* (K.D.) 2366/1, 2367. Penang: *Ridley* 1021, 1109.

var. *excavata;* leaves more coriaceous than in the typical form and somewhat larger, young branches with rather rough bark. *Syzygium excavatum*, Wall. Cat. 3574.

Penang: *Curtis* 697, 749, 8384, 8393. Prov. Wellesley: *Ridley* 6970. Perak: *King's Collector* 7440. Johore: *Ridley* 4076.

var. *Maingayi;* young branches rather stout, the very youngest smooth, the older with deeply striate bark. *Leaves* thickly coriaceous, oblong-lanceolate, shortly acuminate, main-nerves not prominent, the midrib very prominent on the lower surface: length 4·5 to 7·5 in. *Flowers* about ·5 in. long: *fruit* unknown. *E. Maingayi*, Duthie in Hook. fil. Fl. Br. Ind. II, 484.

Malacca: *Maingayi* (K.D.) 750.

This is known only from Maingay's imperfect specimens. It does not appear to me to be separable specifically from *E. claviflora*, Roxb.

var. *glandulosa;* young branches acutely 4-angled: leaves as in var. *Maingayi*: calyx-tube with large pellucid glands.

Malacca: Mount Ophir; only once collected.

53. Eugenia zeylanica, Wight Ill. II, 15: Ic. I, 73. A glabrous tree, 30 to 60 feet high: young branches slender, obsoletely 4-angled or terete, pale-brown. *Leaves* coriaceous, lanceolate, sometimes ovate-lanceolate, obtusely acuminate, the base acute: both surfaces shining, brown when dry, the lower minutely glandular and paler: nerves 10 or 12 pairs, indistinct, interarching near the edge, the reticulations obsolete; length 1·5 to 3·5 in.; breadth ·35 to 1·5 in.; petiole ·05 to ·15 in. *Panicles* axillary and terminal, crowded, the axillary shorter than the leaves, the terminal longer; branchlets short, 4-angled like the main-rachis. *Flowers* numerous, in twos or threes at the apices of the ultimate branchlets, their length (including the stamens) ·35 to ·4 in. *Calyx* funnel-shaped, ·2 in. long, sessile or on a short pedicel; the tube ribbed, granular-tubercled; the limb with 4 or 5 ovate-rotund, concave, erect, deciduous lobes. *Petals* orbicular, 4 or 5, deciduous as a calyptra. *Fruit* pisiform, smooth, white. Duthie in Hook. fil. Fl. Br. Ind. II, 485. Kurz in Journ. As. Soc. Beng. XLVI, Pt. 2, 65; For. Fl. I, 481. *E. spicata*, Lam. Dict. III, 201; DC. *l.c.* (*Syz.*). Trimen Fl. Ceylon I, 171.

Bedd. Fl. Sylv. I, t. 202. *E. glandulifera*, Roxb. Hort. Beng. 37; Fl. Ind. II, 496. *S. zeylanicum*, DC. Prodr. III, 260; Wall. Cat. 3564, *in part*; *Z. corticata*, Wall. Cat. 3565; Dalz. and Gibs. Bomb. Fl. 94. *Acmena zeylanica*, Thwaites Enum. 118. *A. parviflora*, DC. *l.c.* 262. *Jambosa bracteata*, Miq. Fl. Ind. Bat. I, Pt. 1, 437. *S. corticatum*, Wall. Cat. 3565. *Myrtus zeylanica*, Linn. Sp. Pl. 675.—Rheede Hort. Mal. v. t. 20.

In all the provinces; common. DISTRIB.—British India, Ceylon.

54. EUGENIA GRATA, Wight Ill. II, 15. A small glabrous tree: young branches sub-terete, the bark pale-brown, loose. *Leaves* coriaceous, ovate-lanceolate to lanceolate, acuminate, the base acute; upper surface brown when dry, the lower pale, main-nerves numerous, curving, ascending, interarching about ·1 in. from the edge, distinct as is the midrib on the lower surface in the young leaves, indistinct on the upper: length 2 to 3·5 in.; breadth ·85 to 1·5 in.; petiole ·15 to ·25 in. *Inflorescence* and *flowers* as in *E. zeylanica* but the calyx-tube not granular. *Fruit* ovoid, pellucid-dotted, crowned by the small calyx-lobes, ·2 in. long, black when ripe. Kurz in Journ. As. Soc. Beng. XLVI, Pt. 2, p. 65; For. Flora Burma I, 480; Duthie in Hook. fil. Fl. Br. Ind. 486. *Syzyg. gratum*, Wall. Cat. 3586. *S. scabridum*, Wall. Cat. 3564 D. *Myrtus quadrangularis*, Ham.

MALACCA: *Griffith* (K.D.) 2364. PENANG: *Curtis* 317, 756, 2245; *Wallich*. PERAK: *Ridley* 7955, 9456; *King's Collector* 5414, 5433, 6267. ANDAMAN ISLANDS: *King's Collector*. DISTRIB.—Sumatra.

A species very close to *E. zeylanica* but with somewhat larger leaves, glaucous or sub-glaucous beneath. The best distinguishing marks lie however in the calyx-tube which in this is smooth, and in the fruit which in this is ovoid and black.

55. EUGENIA TECTA, King n. sp. A glabrous tree, 20 to 25 feet high: young branches slender, 4-angled; the bark dark-brown, flakey. *Leaves* thinly coriaceous, almost sessile, ovate-lanceolate, shortly and obtusely acuminate, the base rounded and minutely cordate; both surfaces pale-brown when dry; nerves numerous but scarcely visible, the midrib prominent on the lower surface and bearing small scattered tubercles; length 2·5 to 3·25 in.; breadth 1·1 to 1·6 in.; petiole ·05 to ·1 in., densely covered with black tubercles. *Flowers* ·5 or ·6 in. long (including the stamens), crowded in axillary or terminal fasicles, sessile. *Calyx* widely funnel-shaped, tapered to the bracteolate base, minutely dotted; the limb wide, with 5 broad lobes. *Petals* orbicular, yellowish, deciduous. *Fruit* unknown.

PERAK: *King's Collector* 1863.

56. EUGENIA PSEUDO-TETRAPTERA, King n. sp. A tree? Young branches of the thickness of a crow-quill, compressed at the nodes,

4-angled and 4-winged, the bark dark-brown and flakey, deciduous. *Leaves* thinly coriaceous, almost sessile, broadly lanceolate or ovate-lanceolate, the base broad and minutely cordate, the apex shortly and bluntly acuminate; upper surface dull olivaceous-brown with remote black pits, the nerves slightly and the midrib greatly depressed; lower surface pale-brown, with many small black marks especially on the bold thick midrib; main-nerves 14 to 18 pairs, prominent, slightly curved, subascending and interarching at about ·1 in. from the edge; length 2 to 2·25 in.; breadth 1 to 1·5 in.; petiole ·05 in. wrinkled. *Flowers* in terminal, sessile, multi-bracteate glomeruli about ·4 in. long; the bracts about as long as the flowers, large, broadly oblong, blunt, their posterior surfaces bearing many black dots. *Flowers* about ·25 in. long, their pedicels less than ·1 in. *Calyx* cylindric, slightly contracted at the base; the mouth with 5 erect, ovate, blunt, sub-distant teeth, about ·05 in. long. *Petals* sub-orbicular, calyptrate. *Fruit* sub-globular, ·25 in. in diam., crowned by the calyx-teeth.

JOHORE: on Gunong Panti, *Ridley* 4197.

This species comes very near *E. tetraptera*, Miq., but that species has narrower, less conspicuously bracteate flowers and its young branches are covered with glandular hairs. This is also allied to *E. tecta*, King, which has, however, larger flowers in pedunculate bracteate heads. The leaves of the two are almost exactly alike in texture and form, but the dots and pits in those of *E. tecta* are less conspicuous than in these of this plant. This is also closely allied to *E. polita*.

57. EUGENIA POLITA, King. A glabrous tree, 30 to 60 feet high; young branches slender, compressed and acutely 4-angled or winged, their bark pale-brown and deciduous. *Leaves* coriaceous, lanceolate or ovate-lanceolate, bluntly and shortly acuminate, the base abruptly cuneate, both surfaces shining and of a liver-brown colour; main-nerves 10 to 12 pairs, often forked, interarching less than ·04 in. from the edge, hardly visible on the upper surface, length 1·5 to 2·25 in.; breadth ·75 to 1 in.; petiole under ·1 in. *Panicles* shorter than the leaves, axillary and terminal, very condensed, many-flowered, bearing coriaceous bracts of two sorts, those at the base of the panicle with long, subulate points, those at the base of its branches and of the flowers oblong with broad truncate apices, the rachis and branches 4-winged. *Flowers* (including the stamens) ·35 in. long, sessile. *Calyx* funnel-shaped, ribbed, very coriaceous; the limb much prolonged beyond the ovary, but only slightly expanded, with 5 ovate-rotund, concave, erect lobes. *Petals* orbicular, deciduous. *Stamens* not very numerous nor long. *Fruit* globular, crowned by the 5 calyx-lobes, when young minutely pellucid-glandular. *E. zeylanica*, Duthie (not of Wight) in Hook. fil. Fl. Br. Ind. II, 485, *in part*. *Syzyg. politum*, Wall. Cat. 3626.

PENANG: *Porter; Curtis* 511. JOHORE: *Ridley* 4078. PERAK: *Scortechini* 585; *Wray* 2822; *King's Collector* 6930, 8679. MALACCA: *Ridley* 859.

A species superficially resembling *E. zeylanica*, Wight, but really differing greatly from that and every other species within our region by its prominently bracteate and very condensed inflorescence which has winged branchlets. The fruit has been only twice collected.

58. EUGENIA VALDEVENOSA, Duthie in Hook. fil. Fl. Br. Ind. II, 489. A glabrous tree, 20 to 50 feet high: young branches rather thinner than a goose-quill when dry, acutely 4-angled but not winged, the bark brown. *Leaves* coriaceous, elliptic, shortly and abruptly acuminate, the base cuneate or rounded; upper surface olivaceous-brown, reticulate, the nerves faint; lower warm-brown, the main-nerves 14 to 24 pairs, very prominent, curving upwards and interarching in a wavy line ·15 to ·25 in. from the edge; length 5·5 to 8 in.; breadth 2·35 to 3·5 in.; petiole ·2 to ·25 in. *Panicles* terminal or from the upper leaf-axils, pedunculate, rather shorter than the leaves, with many spreading, lax branches, the branchlets compressed. *Flowers* white, sessile, in heads on the ends of the branchlets, ·4 in. long (including the stamens), the buds narrowly clavate. *Calyx* narrowly infundibuliform, tapering equally from base to apex, the mouth truncate, entire. *Petals* calyptrate. *Fruit* depressed-globular, crowned by the short remains of the calyx-tube, smooth, ·75 in. in diam. *L. ellipticum*, Wall. Cat. 3587 in part, (not of other authors).

PENANG: *Wallich; Curtis* 55; *King's Collector* 1579; *Maingay* 723, 762. PERAK: *Scortechini* 1662; *Wray* 2209, 2842; *King's Collector* 737, 2737, 4947, 5122, 5322, 7003, 10246, 10873.

Under the pre-occupied name *L. ellipticum*, Wallich issued this species as No. 3587 of his Catalogue. Mixed with it, however, he issued some leaves of a distinct species from Penang. Good specimens, with leaves exactly agreeing with these, have since been found and that plant has been named *E. pergamacea*, King.

59. EUGENIA OBLONGIFOLIA, Duthie in Hook. fil. Fl. Br. Ind. II, 491. A tree; young branches somewhat thicker than a crow-quill, very pale, 4-angled (sometimes obscurely so). *Leaves* thinly coriaceous, elliptic or oblong-elliptic, shortly acuminate, the base cuneate; both surfaces shining, the nerves and reticulations distinct; upper surface pale-olivaceous, the lower pale-brown; main-nerves 10 to 16, slender, whitish, not much more prominent than the secondary, interarching less than ·1 in. from the edge; length 3 to 4·5 in.; breadth 1·25 to 2 in.; petiole ·3 in. long. *Panicles* terminal, corymbose, spreading, many-flowered, 3 or 4 inches in length and as many in breadth; the short peduncle and numerous branches stout, 4-angled, the branchlets

compressed, all very pale. *Flowers* ·3 or ·4 in. across. *Petals* 4, calyptrate, green. *Calyx* ·2 in. long, campanulate, contracted for half its length into a thin pseudo-stalk, smooth; the mouth truncate or very slightly toothed. *Fruit* (unripe) globular, smooth, crowned by the short, wide remains of the calyx, ·35 in. in diam.

Malacca: *Maingay* (K.D.) 746. Singapore: *Ridley* 360, 4993, 10131. Perak: *King's Collector* 6012, 8848, 10883.

var. *parviflora;* flowers smaller than in the typical form: leaves oblong-lanceolate, tapering to each end, 3·5 to 5·5 in. long and 1 to 1·5 in. broad.

Perak: *Scortechini* 618.

var. *robusta*, King; *calyx* ·35 in. long; panicles, branches of panicle and young twigs thicker than in the typical form.

Perak: *Scortechini* 216.

60. Eugenia subhorizontalis, King n. sp. A small tree; young branches thinner than a goose-quill, terete, blackish-brown when dry. *Leaves* thinly coriaceous, oblong or elliptic-oblong, tapering to each end, shortly and sharply acuminate, the base cuneate, the edges somewhat recurved (when dry), the upper surface dark olivaceous-brown and shining, the midrib depressed, all the nerves faint, lower surface dark brown, not olivaceous, duller than the upper, the midrib very bold and convex, the main-nerves 15 to 20 pairs, sub-horizontal, thin, but rather prominent and shining, interarching to form a bold intramarginal line ·1 in. from the edge, the secondary nerves and reticulations rather distinct; length 4·5 to 7 in.; breadth 1·5 to 2·3 in.; petiole ·5 to ·6 in. *Panicles* axillary and terminal, the former shorter than the leaves, the latter often longer, lax: the branches rather sparse, spreading, compressed, obscurely 4-angled. *Flowers* white, sessile, in clusters of 3 to 6 at the ends of the branchlets, globose-clavate in bud. *Calyx* ·25 in. long, funnel-shaped, contracted to a pseudo-stalk for half its length: the limb with 4 shallow, broad, rounded (sometimes acute) lobes. *Fruit* unknown.

Perak: *Wray* 2118, 2097. Distrib.—Sumatra, Hort. Bogor. 3350 under the name of *E. punctulata*, Miq., which it is not.

61. Eugenia Valetoniana, n. sp. King. A tree, 60 to 80 feet high; young branches thicker than a crow-quill, terete, the bark pale-brown, flakey. *Leaves* as in *E. Griffithii* but somewhat narrower and with rather more numerous main-nerves. *Flowers* sessile in small terminal or axillary panicles shorter than the leaves, with very few short, terete, few-flowered cymose branches, or in small pedunculate cymes. *Calyx* ·3 in. long, clavate-campanulate, constricted into a short pseudo-stalk; the wide mouth truncate or with 4 deciduous, short, rounded lobes.

Petals small, orbicular, deciduous. *Fruit* when unripe pyriform, when ripe globular, crowned by the wide calyx-limb, ·5 in. long.

PERAK: *King's Collector* 5982, 6090.

A species near *E. Griffithii*, and also near *E. Clarkeana* and *E. Koordersiana*, but with much smaller panicles and fruit at first pyriform.

62. EUGENIA EXPANSA, Duthie in Hook. fil. Fl. Br. Ind. II, 491. A tree, 20 to 50 feet high; young branches thinner than a goose-quill, terete, pale-brown. *Leaves* coriaceous, oblong-lanceolate or oblong-elliptic, acuminate, the base cuneate, both surfaces brown (when dry) and shining, the lower paler; main-nerves 20 to 24 pairs, faint, spreading, connected by numerous loops, not very prominent in either surface but distinctest on the lower, intramarginal line less than ·1 in. from the edges: length 4 to 6·6 in.; breadth 1 to 2·25 in.; petiole ·15 to ·2 in. *Panicles* numerous, terminal and axillary, usually 2 or 3 together, varying in length from less than one inch to several inches, the longer ones bearing a few slightly compressed branches with 5 to 8 sessile flowers crowded at their apices. *Flowers* (including the stamens) ·3 in. long (sometimes longer), clavate in bud. *Calyx* ·15 in. long, infundibuliform, minutely rugulose; the mouth truncate, undulate, slightly reflexed. *Petals* orbicular, calyptrate. *Fruit* unknown. *Syzygium expansum*, Wall. Cat. 3567. *S. euneuron*, Miq. Fl. Ind. Bat. Suppl. 314.

PENANG: *Wallich* 3567; *Curtis* 247. PERAK: *Wray*, *Scortechini*, *King's Collector*; very common.

63. EUGENIA CHLOROLEUCA, King. A small tree or shrub; young branches almost as thin as a crow-quill, terete below but 4-angled near the apex, yellowish. *Leaves* coriaceous, oblanceolate, shortly and bluntly acuminate, much narrowed at the base; both surfaces pale-olivaceous; the upper tinged with brown, shining, the main-nerves indistinct or invisible; the lower very pale, dull, the 12 to 16 main-nerves spreading, very faint, the edge thickened and slightly recurved; length 3 to 5·5 in.; breadth 1 to 2·25 in.; petiole ·3 to ·35 in. *Panicles* much shorter than the leaves, mostly terminal, rarely axillary, trichotomous, the branchlets also trichotomous, all acutely 4-angled and striate, the bracteoles at the nodes and at the bases of the flowers short, concave, ovate. *Flowers* bibracteolate at the base, in threes, ·4 in. long (including the stamens) on 4-angled pedicels ·1 in. long. *Calyx* ·15 in. long, minutely rugulose; the mouth with 4 broad, shallow teeth. *Fruit* ellipsoid, rugulose, crowned by the 4 persistent calyx-teeth, length (unripe) ·3 in.

PERAK: *King's Collector* 1901, 4951, 7307; *Scortechini* 45; *Wray* 2917.

This closely resembles *Eugenia fastigiata* (*Calyptranthes fastigiata*, Blume), but the leaves have shorter petioles and fewer nerves and the fruit of this is corrugated

rugulose and not glandular. This also resembles *Eugenia sylvestris* (*Caryophyllus sylvestris*, Blume) almost exactly in leaves: but the fruit of the latter is very different.

64. Eugenia nigricans, King n. sp. A large tree; young branches rather thicker than a crow-quill, sub-terete, dark-brown when dry. *Leaves* oblong to oblong-elliptic, shortly and abruptly acuminate, the base more or less cuneate; both surfaces very dark-olivaceous and dull (when dry), the lower with a reddish tinge: nerves very numerous and close together, straight and sub-horizontal, all faint below and distinct above, the reticulations few and faint on both surfaces, the edge recurved, and the intramarginal line very near it; length 2·5 to 4 in.; breadth 1·4 to 2 in.; petiole ·3 to ·4 in. *Panicles* axillary and terminal, not more than half as long as the leaves with few lax trichotomous spreading branchlets, all 4-angled. *Flowers* white, ·3 in. long (including the stamens), in threes, sessile, clavate in bud. *Calyx* ·15 in. long, wrinkled, funnel-shaped, narrowed for half its length into a pseudo-stalk, the mouth wide and truncate. *Petals* deciduous. *Fruit* unknown.

Perak: *Wray* 2221.

65. Eugenia inophylla, Roxb. Hort. Beng. 37: Fl. Ind. II, 496. A glabrous tree, 40 to 60 feet high; young branches rather thinner than a goose-quill, terete, dark-brown. *Leaves* coriaceous, narrowly elliptic or elliptic-lanceolate, rather abruptly acuminate, the base cuneate; both surfaces when dry smooth, shining, the numerous thin, curved, ascending main-nerves indistinct; the upper surface almost black, the lower deep-brown; length 3 to 5 in.; breadth 1·25 to 2·25 in.; petiole ·2 to ·4 in. *Panicles* corymbose, in the upper leaf-axils and terminal, nearly as long as or longer than the leaves, on rather long peduncles, many-flowered, each from 2·5 to 3 in. across, the branches and branchlets numerous, 4-angled. *Flowers* 2 or 3 together, sessile at the apices of the branches, ·4 in. long (including the coloured stamens) white, clavate in bud. *Calyx* funnel-shaped, rather abruptly tapered to the base, ·2 in. long, smooth; the mouth truncate, with 5 very obscure, short, broad teeth. *Petals* calyptrate. *Fruit* (according to Roxburgh) pear-shaped, large. Duthie in Hook. fil. Fl. Br. Ind. II, 481 *in part*. Wight Ic. 623 (*bad*). *Jambosa inophylla*, Miq. Fl. Ind. Bat. I, Pt. 1, 433. *Syzygium inophyllum*, Wall. Cat. 3600 *in part*; DC. Prodr. III, 260.

Perak: *Wray* 1377, 2554, 2655, 2734; *King's Collector* 4741, 6079, 655, 8481. Penang: *Curtis* 973, 974, 2621.

Two specimens of this are included in the Linnæan Society's set of the Wallichian plants under 3600. The other two sheets belong to two different species.

66. Eugenia oblata, Roxb. Hort. Beng. 37; Fl. Ind. II, 493.

A tree, 40 to 50 feet high; young branches terete (when dry), reddish-brown. *Leaves* thinly coriaceous, oblong to elliptic-oblong, or broadly lanceolate, acuminate, the base cuneate; both surfaces brown (when dry), shining, the upper often tinged with olivaceous and the lower with red, main-nerves 20 to 24 pairs, close, connected by numerous secondary nerves and reticulations, indistinct on the upper but distinct on the lower surface, intramarginal nerve very close to the slightly recurved margin; length 3·5 to 5 in.; breadth 1 to 2·5 in.; petiole ·2 to ·25 in. *Panicles* axillary and terminal, shorter than the leaves, often pedunculate, corymbose, the branches and branchlets few, crowded, obtusely 4-angled. *Flowers* ·5 in. long, including the stamens, white, sessile, shortly clavate in bud. *Calyx* ·25 in. long, funnel-shaped, the mouth with 4 deciduous, short, blunt lobes, narrowed to a pseudo-stalk. *Petals* orbicular, calyptrate. *Fruit* as large as a cherry when ripe, smooth, pulpy, the pericarp rather thick; seed solitary. Wight Ill. II, 15; Ic. t. 622; Kurz in Journ. As. Soc. Beng. XLVI, Pt. 2, 67; For. Fl. I, 488; Duthie in Hook. fil. Fl. Br. Ind. II, 492. *S. oblatum*, Wall. Cat. 3569. *S. pulchellum*, Wall. Cat. 3566 *in part*. *Syzg. truncatum*, Miq. Fl. Ind. Bat. I, Pt. 1, 455. *Jambosa pulchella*, Miq. Fl. Ind. Bat. I, Pt. 1, 422. *E. comosa*, Wall. Cat. 3566 D; *l.c.* 3600 C (under *E. inophylla*).

Malacca: *Derry* 1178. Perak: *Scortechini*. Province Wellesley: *Curtis* 9378*a*. Penang: *Ridley* 9378.

67. Eugenia Bernardi, King n. sp. A medium-sized tree; young branches thicker than a crow-quill, slightly compressed, dark-brown, the older terete and grey. *Leaves* thinly coriaceous, broadly elliptic, abruptly and shortly acuminate, the base slightly cuneate; both surfaces brown (when dry) and shining, the lower slightly paler; the numerous close nerves and their connecting reticulations distinct on both; the intramarginal line less than ·1 in. from the edge, the midrib depressed on the upper, prominent on the lower surface; length 3·5 to 4·5 in.; breadth 1·75 to 2·25 in.; petiole ·25 to ·4 in. *Panicles* terminal, occasionally from the branches below the leaves, shorter than the leaves when in flower but longer in fruit, densely corymbose, trichotomously branched, many-flowered, the peduncle and lower branches terete, the branchlets 4-angled. *Flowers* partly sessile and partly on very short thick pedicels, the buds obovoid, obtuse. *Calyx* ·15 in. long, campanulate-cylindric, tapering slightly to the base but not forming a pseudo-stalk, smooth, the limb truncate. *Petals* falling off in a depressed calyptra. *Stamens* ·25 in. long. *Fruit* turbinate, black when ripe, without pulp, crowned by the minute remains of the calyx, ·2 in. in diam.

Perak: *Scortechini* 326. Selangor: *Ridley* 8617. Penang: *Curtis* 975, 2845.

Remarkable for its short, obovoid flower-buds; closely related to *E. simulans* which has, however longer clavate buds.

68. Eugenia Prainiana, King n. sp. A tree 60 to 80 feet high; young branches as thick as a goose-quill, terete, brown. *Leaves* thickly coriaceous, elliptic-oblong, the apex shortly acuminate, the base cuneate; upper surface dark-brown, shining, the midrib pale and depressed, the nerves slightly raised, faint; lower surface yellowish-brown, dull, the 20 to 30 pairs of main nerves and the intramarginal one slightly raised but indistinct, edges slightly recurved; length 3·5 to 5 in.; breadth 1·5 to 1·75 in.; petiole about ·5 in. *Panicles* mostly terminal, but a few of smaller size from the upper leaf-axils, about half as long as the leaves while in flower, many-flowered, much condensed, corymbose, broader than long; the peduncles short, stout, somewhat 4-angled like the stout, short branches. *Flowers* in threes at the ends of the branchlets, sessile, white, clavate in bud. *Calyx* ·35 in. long, funnel-shaped, tapering gradually to the base: the mouth 5-lobed, the lobes broad, rounded, and with pale, cartilaginous tips. *Petals* 5 orbicular, glandular-dotted, much longer than the calyx-lobes, apparently calyptrate. *Fruit* (unripe and excluding the long calyx-tube) globular-ovoid, ·75 to 1 in. in length, and ·75 in. in diam., crowned by the large, stout, withered, 5-toothed calyx-limb ·25 in. long.

Perak: *Wray* 3990; *King's Collector* 5309, 6584.

69. Eugenia Pearsoniana, King n. sp. A tree 80 to 100 feet high; young branches thicker than a crow-quill, pale brown or whitish, terete. *Leaves* coriaceous, ovate, the base rounded, the apex caudate-acuminate, the edges somewhat recurved; upper surface olivaceous-brown, shining, the numerous nerves faint, the midrib depressed; lower surface brown, dull, the nerves fainter than on the upper, the midrib sharp and prominent; length 2·75 to 4 in.; breadth 1·5 to 2 in.; petiole ·25 to ·3 in. *Panicles* terminal, 1·5 in. long, not pedunculate, branching from the base; the branches short, thick, slightly compressed and slightly 4-angled. *Flowers* in twos or threes at the ends of the branchlets, about ·5 in. long (including the stamens), white, clavate in bud, some sessile and others on very short, stout pedicels. *Calyx* ·25 in. long, funnel-shaped gradually tapering to the thick base; the mouth truncate. *Petals* 5, orbicular, calyptrate. *Fruit* unknown.

Perak: *King's Collector* 3526.

Allied to *E. Prainiana*, but differing in the truncate calyx-limb, sessile panicles and thinner young branches the bark of which moreover is nearly white.

70. Eugenia lævicaulis, Duthie in Hook. fil. Fl. Br. Ind. II, 492. A tree; young branches half as thick as a goose-quill, terete, very pale. *Leaves* coriaceous, oblong-lanceolate or oblong-elliptic, shortly and

abruptly acuminate, the base cuneate; upper surface dark-olivaceous (when dry) and shining, the midrib bold and depressed and the nerves not depressed but faint; lower surface chocolate-brown, dull, the numerous nerves and reticulations indistinct, the intramarginal line very close to the edge, faint; length 3·5 to 4·5 in.; breadth 1 to 1·6 in.; petioles ·2 to ·3 in. *Panicles* mostly terminal, but a few in the upper axils, condensed, much shorter than the leaves; branches few, crowded, very stout, obscurely 4-angled, shining. *Flowers* ·5 or ·6 in. long (including the stamens), in threes at the apices of the branchlets, the middle one on a short thick pedicel, the lateral pair sessile. *Calyx* ·25 in. long, campanulate, tapering regularly to the base; the mouth with 5 small, bluntly triangular teeth reflexed after flowering. *Petals* orbicular, much larger than the calyx-teeth, calyptrate. *Fruit* when ripe as large as a cherry, depressed at both ends, pulpy, the apex crowned by the small circular remains of the calyx. Duthie in Hook. fil. Fl. Br. Ind. II, 492 (in part). *E. inophylla*, ? in Wall. Cat. 3600 and not of Roxb.

Malacca: *Maingay* Herb. prop. 3012 (K.D. 753 *in part*). Penang: *Wallich*; *Curtis* 750, 666, 2246, 2247.

Hitherto collected only in Malacca and Penang. This is one of three plants issued doubtfully by Wallich as *E. inophylla*, Roxb.; and one of two issued from Herb. Kew, as 753 Maingay. There are in Herb. Kew, three Maingayan sheets under the distribution 753. Two of these bore the same number in Maingay's own collection, *viz.*, 3012: the third, which is imperfect, bore his 1558, and is a different plant from his 3012 and is really *E. anisosepala*, Duthie. *E. lævicaulis* is allied to *E. oblata*, Roxb., but has more contracted panicles with much shorter branches, more oblong flower-buds, shorter stamens, more faintly nerved leaves which are usually smaller.

71. Eugenia Goodenovii, King n. sp. A tree, 50 to 70 feet high; young branches somewhat thicker than a crow-quill, terete, with compressed nodes, the bark dull pale yellowish-grey. *Leaves* coriaceous, oblong-elliptic, rarely somewhat lanceolate, the base much cuneate, the apex acute or sometimes shortly and bluntly acuminate; both surfaces rather dull when dry, yellowish-brown, the lower somewhat paler, the main-nerves many pairs, inconspicuous on either surface as are the secondary nerves and the reticulations; the intramarginal nerve faint, about ·1 in. from the edge; length 3·5 to 5·5 in.; breadth 1·5 to 2 in.; petioles ·2 to ·3 in. *Panicles* terminal and from the axils of a few of the upper leaves, 1·5 to 2 in. long and about as broad; the branches few, spreading, obscurely 4-angled. *Flowers* shortly pedicelled, (when expanded) from ·2 to ·3 in. across, the buds clavate from ·2 to ·3 in. long. *Calyx* funnel-shaped, the mouth with 4 broad, rounded lobes. *Petals* 4, sub-orbicular, calyptrate. *Fruit* broadly urn-shaped, the apex broad

and truncate, crowned in the middle by the short conical remains of the style, about ·5 in. in diam. when dry and about ·6 in. long, the base with a fleshy papilla and a short stout stalk. *Syz. rigidum*, Wall. Cat. 3581.

Malacca: ?; *Wallich*; *Goodenough* 1759. Selangor: *King's Collector* 8741. Distrib.—Java.

Wallich's specimens of this are referred in the Flora of British India to *E. chlorantha*, Duthie. The better examples collected since Wallich's time by Messrs. Goodenough and Kunstler however shew this to be a distinct species, Wallich's specific name for which would have been retained but for the priority of DeCandolle's *Eugenia rigida*. This strongly resembles *E. Zippelliana*, Miq., as that species is represented at Kew.

72. Eugenia linociieroidea, King. A tree, 40 to 50 feet high; young branches when in flower as thick as a crow-quill (thicker when in fruit), dark-brown. *Leaves* coriaceous, lanceolate, shortly acuminate, the base cuneate; both surfaces of an olivaceous, leaden colour when dry, the upper very dark and shining, the nerves numerous, indistinct: the lower paler and dull, the nerves straight spreading, black, interarching less than ·05 in. from the edge, the reticulations not prominent: length 2 or (rarely) 3 in.; breadth ·6 to 1 in.; petioles ·1 in. *Panicles* terminal, as long as the leaves when in flower (longer when in fruit), much branched, many-flowered, broader than long: main-branches subhorizontal, somewhat 4-angled, the branchlets acutely so. *Flowers* ·4 in. long (including the stamens), sessile, the buds clavate. *Calyx* ·3 in. long, funnel-shaped, the lower half narrowed into a vertically ridged pseudo-stalk; the mouth with 4 deep, broad, rounded lobes. *Petals* 4, sub-orbicular, calyptrate. *Fruit* oblong, with deep rugulose, vertical ridges, the apex crowned by the enlarged calyx-limb and its 4 inflexed teeth: length (unripe) ·35 in.

Perak: *King's Collector* 4580, 7980, 8094; *Wray* 1898, 2595.

73. Eugenia myrtifolia, Roxb. Hort. Beng. 37; Fl. Br. Ind. II, 490. A shrub or small tree; young branches 4-angled, pale-brown, the older terete, greyish. *Leaves* thinly coriaceous, lanceolate to broadly ovate, shortly acuminate, the base acute: both surfaces shining, dotted, when dry brown, the lower paler; nerves close and numerous, thin but distinct on both surfaces; length 1·5 to 2·5 in.; breadth ·75 to 1·35 in.; petiole ·15 to ·2 in. *Panicles* mostly terminal but a few from the upper leaf-axils, pedunculate, longer than the leaves; branches lax, spreading, corymbose, 4-angled. *Flowers* ·3 in. long (including the stamens) sessile or pedicellate on the apices of the branchlets in twos or threes. *Calyx* ·15 in. long, clavate, the mouth with 4 very narrow lobes or almost truncate. *Petals* 4, orbicular, calyptrate. *Fruit* globular, pisiform, pulpy, bluish-black, smooth, crowned by the cupular, truncate calyx-

limb, 1-seeded. Duthie in Hook. fil. Fl. Br. Ind. II, 483; Wight Ill. II, 15; Ic. t. 618; Kurz in Journ. As. Soc. Beng. XLVI, Pt. 2, 67; For. Fl. I, 486. *Syzygium myrtifolium*, DC. Prodr. III, 261; Wall. Cat. 3571; Miquel Fl. Ind. Bat. 1, Pt. I, 456. *C. oleina*, Wight Ill. II, 15.

SINGAPORE: *Wallich.* PENANG: *Wallich.* PERAK: *Wray* 2703; *King's Collector* 8379.

74. EUGENIA STAPFIANA, King n. sp. A shrub, 2 to 6 feet high; young branches rigid, slender, 4-angled, the bark brown and deciduous in long flakes. *Leaves* very coriaceous, lanceolate or broadly elliptic tapering to the blunt sub-acute (occasionally rounded and retuse) apex, the base slightly cuneate or rounded; both surfaces olivaceous-brown when dry, the upper with large scattered pits, the lower paler, not dotted or pitted, nerves and reticulations very indistinct on both surfaces, the midrib distinct on the lower: length ·5 to 1 in.; breadth ·4 to ·8 in.; petiole under ·1 in. *Panicles* terminal, shorter than or as long as the leaves, few-flowered; the branches few, rigid, stout, square and with 4 thick wings. *Flowers* ·3 in. long, with several bracteoles at their insertion on the short, stout, papillose pedicels. *Calyx* ·15 in. long, narrowly campanulate, slightly inflated below the middle, ribbed and densely papillose externally, the mouth slightly expanded and with 4 or 5 spreading rounded teeth. *Petals* orbicular, free. *Stamens* about ·15 in. long. *Fruit* sub-globular, crowned by the calyx lobes, white.

PERAK: *Scortechini* 336; *Wray* 216, 1582, 1619: at elevations of 5000 to 7000 feet.

This belongs to a group of dwarf montane species of *Evgenia* well-represented on the mountains of Ceylon and Southern British India and of which some species from the mountain of Kina Balu in Borneo have recently been described and figured in the Linnæan Transactions by Dr. O. Stapf. of the Kew Herbarium. The nearest ally of this is *E. kinabaluensis*, Stapf., from which this is distinguished by its larger inflorescence with winged branchlets, granular calyx-tube and pedicels, and less rotund leaves, entire (not retuse) at the apex.

75. EUGENIA WRAYI, King n. sp. A small tree; young branches obtusely 4-angled, brown (when dry) smooth, the older terete, rough, the bark grey. *Leaves* thickly coriaceous, broadly elliptic or sub-rotund the apex obtuse or sub-obtuse entire, not narrowed at the base: upper surface brown, the nerves and reticulations faint, the midrib depressed; lower surface pale sub-glaucous, the nerves and reticulations numerous and distinct, the midrib broad; length ·75 to 1·35 in.; breadth ·65 to 1·15 in.; petiole ·1 in. or less. *Panicles* solitary, compact, terminal, in a short peduncle; its branches short and stout, slightly 4-angled, not winged or papillose. *Flowers* greenish, ·35 in. long, (including the stamens) sessile in clusters of 3 or 4 at the ends of the branchlets, with a single deciduous bracteole at the base of each, the buds

shortly clavate. *Calyx* funnel-shaped, ·15 in. long; not much narrowed to the base, smooth; the mouth with 5 unequal, broad rounded lobes. *Petals* calyptrate. *Stamens* short. *Fruit* unknown.

PERAK: at elevations of 5,000 to 7,000 feet; *Wray* 321, 1504, 3859; *Scortechini* 313.

This is another of the dwarf montane species. It resembles the Nilgiri *E. calophyllifolia*, Wight, very closely indeed and the differences between the leaves of the two can be appreciated only by comparison of actual specimens. The reticulations in the lower surface of this are finer and the enclosed spaces shorter. *E. calophyllifolia* has 4-merous flowers and the flowers of this are 5-merous. Fruit of this is at present unknown. From it, when found, a good character may, it is hoped, be obtained.

76. EUGENIA SETOSA, King n. sp. A shrub or creeper: young branches as thick as a crow-quill, dark-brown, densely clothed on the rachis and branches of the inflorescence with coarse subulate hairs mixed with brown scurf. *Leaves* thinly coriaceous, narrowly oblong-lanceolate, shortly and abruptly acuminate, the base rounded; upper surface (when dry) olivaceous with minute scattered black dots, the lower tinged with brown, minutely pustulate: nerves very numerous and close, sub-horizontal, interarching very near the slightly recurved minutely undulate edge; length 1·35 to 2·75 in.; breadth ·4 to ·85 in.; petiole under ·1 in. *Panicles* axillary and terminal, about as long as the leaves, pedunculate, with spreading many-flowered branches. *Flowers* crowded on the branchlets, ·4 in. long (including the stamens), clavate, the buds with globular apex abruptly contracted below, sessile or on short pedicels. *Calyx* campanulate above, contracted about the middle into a pseudo-stalk; the mouth truncate but with 5 small triangular deciduous lobes. *Petals* orbicular, deciduous. *Fruit* turbinate, crowned by the small truncate calyx-limb, minutely covered with pellucid, granule-like glands; length and breadth about ·35 in.

PERAK: *Wray* 2704; *King's Collector* 5266, 6601, 6793.

77. EUGENIA INASENSIS, King n. sp. A small white-flowered tree; young branches thicker than a crow-quill, terete with compressed nodes; the bark pale and rather smooth. *Leaves* coriaceous, broadly elliptic to elliptic-oblong, sometimes slightly obovate, much tapered to the base, the apex with a short, abrupt blunt point, the edges recurved; when dry, the upper surface shining, pale yellowish-brown, the midrib depressed; the lower paler and dull, the midrib bold; main-nerves inconspicuous on both; length 2·5 to 4 in.; breadth 1·25 to 2·25 in.; petiole ·2 to ·4 in. *Panicles* much shorter than the leaves, terminal or from the upper leaf-axils, solitary or several together, pedunculate, usually 3-branched, the peduncle and branches dark-coloured, compressed. *Flowers* in threes, ·3 to ·4 in. in diam. when expanded, their

buds obovoid nearly ·2 in. long. *Calyx* campanulate, sessile, not tapering into a pseudo-stalk, the mouth with 5 small rounded lobes, or truncate. *Petals* 5, orbicular-calyptrate. *Fruit* unknown.

PERAK: or Gunong Inas at elevations of about 5,000 feet; *Wray* 4144, 4150, 5154.

A species known only from Mount Inas. It is allied to *E. subdecussata*, Duthie, in many respects, but differs from that species in having petiolate leaves tapering much to the base and having recurved edges. The main nerves are, moreover, less distinct and the under surface is not dotted. The twigs also differ in being very pale in colour instead of brown.

78. EUGENIA SUBDECUSSATA, Duthie in Hook. fil. Fl. Br. Ind. II, 491. A tree or shrub; young branches sub-terete, compressed below the nodes, brown. *Leaves* sessile or nearly so, coriaceous, elliptic or oblong-elliptic, rarely somewhat obovate-elliptic, (sub-rotund in VAR. *montana*), tapering but little to either end, the apex sometimes with a short blunt acumen, the base minutely cordate; both surfaces dark-brown when dry, the upper polished; the lower slightly paler and pellucid-dotted; nerves numerous but not prominent on either surface, the midrib prominent on the lower; length 2 to 5·5 in.; breadth 1·35 to 3 in.; petiole very short or absent (about ·1 in. long in VAR. *montana*). *Panicles* terminal, shorter than the leaves, pedunculate, the peduncle and all the branches and branchlets much compressed; the branches short, crowded. *Flowers* ·35 in. long (including the stamens), sessile in heads on the apices of the branchlets; the buds shortly clavate. *Calyx* funnel-shaped, the mouth with 5 small triangular teeth. *Petals* calyptrate. *Fruit* globular, crowned by the small calyx-cup, smooth, ·5 or ·6 in. in diam. *Syzygium subdecussatum*, Wall. Cat. 3589 *in part.*

SINGAPORE: *Wallich*; *Ridley* 4662, 4814, 9498, 10389. MALACCA: *Maingay* (K.D.) 740; *Derry* 476, 975; *Ridley* 1985. PERAK: *King's Collector*; *Scortechini*; very common from the sea-level to elevations of 5,000 feet.

A species readily recognised by the elliptic polished leaves, tapering very little to either end, also by the compressed short branchlets of the inflorescence and the shortly clavate flowers.

VAR. *colorata*, King; *panicle* very condensed, flower-buds longer than in the typical form, leaves when dry tinged with red. *E. colorata*, Duthie in Hook. fil. Fl. Br. Ind. II.

MALACCA: *Maingay* (K.D.) 749.

Only a single specimen of this is known. It appears to me a form of *E. subdecussata*, and unworthy of specific rank.

VAR. *montana*, King; shrubby; *leaves* often sub-rotund or obovoid elliptic, from 1 to 2·5 in. long; panicles longer than the leaves.

Perak: *Scortechini* 294; *Wray* 217, 3844. *King's Collector* 8030.

Syzygium apodum, Miq., a Sumatran species, closely resembles this but has thicker leaves with strongly recurved margins.

79. Eugenia punctulata, King. A tree, 30 to 50 feet high; young branches thinner than a goose-quill, slightly compressed, the bark pale-brown, deciduous in flakes, and the older branches grey. *Leaves* coriaceous, obovate or oblanceolate, the apex broad and usually blunt but sometimes with a short point, much narrowed at the base, the edges slightly recurved; upper surface olivaceous (when dry), shining, the nerves indistinct; lower olivaceous-brown, the numerous straight nerves and reticulations faint; length 1·5 to 3 in.; breadth 1 to 1·75 in.; petiole ·2 to ·25 in. *Panicles* rather lax, terminal, longer than the leaves (often twice as long, especially in the fruiting stage): branches numerous, spreading, compressed or 4-angled, many-flowered. *Flowers* sessile at the apices of the branchlets with a few scarious bracteoles at their bases. *Calyx* campanulate, only ·1 in. long, its mouth obscurely 4-toothed, smooth. *Petals* deciduous. *Fruit* ovoid, much wrinkled when dry and crowned by the wide calyx-limb, ·4 in. long (unripe). *Syzygium punctulatum*, Wall. Cat. 3583. *Jambosa punctulata*, Miq. Fl. Ind. Bat. Suppl. 310.

Singapore: *Wallich*. Perak: *King's Collector* 3475, 3782, 6426, 6671, 6937, 10984; *Wray* 1125, 3972. Singapore: *Ridley* 3893, 4988, 4989, 6540. Malacca: *Derry* 1154. Distrib.—Borneo.

This is doubtfully referred in the Flora of British India to *E. pyrifolia*, Wall. The more complete specimens collected since that Flora was published show that *E. punctulata* is a perfectly distinct species.

80. Eugenia bracteolata, Wight Ill. II, 15: Ic. t. 531. A tree, 30 to 60 feet high; young branches boldly 4-angled, pale-brown, about as thick as a goose-quill. *Leaves* coriaceous, oblong-obovate or oblanceolate, the apex broad and with a short blunt apiculus, rarely sub-acute, the base cuneate: when dry the upper surface dark-brown, shining, obscurely pitted, the nerves faint and impressed; the lower paler brown, neither pitted or dotted, the numerous pairs of horizontal nerves and the wide reticulations slightly distinct, the midrib very prominent; length 3 to 5 in.; breadth 1·5 to 2 in.; petiole ·3 to ·5 in. *Panicles* terminal, as long as the leaves, with small, ovate, concave bracteoles at all its nodes, corymbose, many-flowered, the branches few, the branchlets numerous and all (like the peduncle) acutely 4-angled and grooved. *Flowers* in threes at the apices of the branchlets: bibracteolate at the base and on short pedicels, ·3 in. long including the stamens, globular-clavate in bud. *Calyx* ·15 in. long, shortly infundibuliform, rugulose, the mouth with 4 rounded lobes. *Petals* whitish, calyptrate. *Fruit*

oblong, tapering to each end, the apex crowned by the 4 persistent calyx-teeth, minutely rugulose, length (*very unripe*) ·25 in. Kurz in Journ. As. Soc. Beng. XLVI, Pt. 2, 66; For. Flora Burm. I, 482; Duthie in Hook. fil. Fl. Br. Ind. II, 488.

Malacca: *Maingay* (K.D.) 770. Penang: *Curtis* 1089, 3175. Perak: very common. Distrib.—Burma: *Griffith* (K.D.) 2387; *Helfer* (K.D.) 2386, 2373.

Easily recognised by its profusely bracteolate inflorescence and acutely 4-angled branches and panicle. *Curtis's* 1089 is when dry of a much paler colour than the Perak specimens, otherwise it agrees.

81. Eugenia venulosa, Wall. in Cat. ex Duthie in Hook. fil. Fl. Br. Ind. II, 490. A tree, 20 to 25 feet high; young branches thicker than a crow-quill, terete, pale. *Leaves* coriaceous, elliptic-rhomboid to oblanceolate, the apex obtuse or sub-acute, the base cuneate; upper surface pale-brown often with an olivaceous tint (when dry), dotted, shining, duller, the nerves faint; under surface paler, and not olivaceous, the main-nerves 10 to 14 pairs, rather straight, sub-erect, not much more prominent than the secondary nerves, both sets connected by numerous loops, the intramarginal nerves about ·1 in. distant from the slightly recurved edge; length 2 to 3 in.; breadth ·8 to 2·2 in.; petiole ·1 to ·15 in. *Panicles* terminal, broadly corymbose, much-branched, usually shorter or not much longer than the leaves (longer in var.); peduncle and branches 4-angled, the flowers in threes at the apices of the branchlets, clavate in bud, sessile. *Calyx* ·2 in. long, rugulose, campanulate in its upper half, the lower contracted, the mouth truncate, or slightly lobed. *Petals* calyptrate. *Fruit* globular, submamillate, the apex with a deep, circular, entire pit bounded by the calyx-walls, ·5 in. in diam.

Malacca: *Griffith* (K.D.) 2405; *Maingay* (K.D.) 741. Singapore: *Wallich; Ridley* 5985. Johore: 4986. Perak: *Scortechini* 188; *Wray* 3016.

var. *macrothyrsa; panicles* longer than the leaves and as much as 4 in. broad.

Malacca: *Griffith* (K.D.) 2405; *Derry* 21; *Maingay* (K.D.) 719. Johore: *Ridley* 4196. Perak: *Scortechini* 188.

82. Eugenia pseudo-subtilis, King. A tree, 30 or 40 feet high; young branches pale greyish-yellow, or almost white, slightly thicker than a crow-quill, terete. *Leaves* very coriaceous, narrowly oblong-elliptic tapering from the middle to each end, the apex sub-acute or obtuse, the base cuneate; both surfaces when dry dull, pale-brown; the upper pellucid-pitted and the nerves faint; the lower paler not pitted, the midrib prominent but the 5 to 7 pairs of main-nerves faint, sub-erect, curved, not interarching near the edge, length 2·25 to 4 in.;

breadth 1·1 to 1·25 in. petiole ·5 to ·75 in. *Panicles* shorter than or nearly as long as the leaves, axillary and terminal, often 2 or 3 together, few-branched; the branches divaricate, 4-angled, few-flowered, trichotomous. *Flowers* sessile, small. *Calyx* only ·05 in. long, at first almost cylindric slightly narrowed to the base, afterwards urn-shaped and finally globular, the mouth with a projecting rim, truncate but with 4 broad, shallow teeth. *Fruit* the size and shape of a pepper-corn, smooth, surmounted by the small remains of the calyx and by the base of the style. *E. brachiata*, Duthie (not of Roxb.) in Hook. fil. Fl. Br. Ind. II, (*in part*).

Penang: *Curtis* 3475. Perak: *King's Collector* 6946. Singapore: *Ridley* 4990.

var. *platyphylla*; *leaves* broader than in the typical form, elliptic, oblanceolate-oblong, sub-acute or with broad rounded apex, the base always cuneate.

Singapore: *Ridley* 3962. Malacca: *Derry*; *Scortechini*. Perak: Penang: *Curtis* 32. *Syzyg. ribesoides*, Wall. Cat. 3553. *Syzyg. cinereum*, Wall. Cat. 3576.

var. *subacuminata*; *leaves* bluntly acuminate.

Penang: *King's Collector* 1793.

This species closely resembles *S. subtile*, Miq., in its pale branches, in the shape and texture of its leaves and in its flowers. The leaves however have only about one-third as many nerves. The two are however very near.

83. Eugenia microcalyx, Duthie in Hook. fil. Fl. Br. Ind. II, 493. A tree, 40 to 50 feet high; young branches slender, 4-angled, brown. *Leaves* coriaceous, oblong-obovate or oblong-lanceolate, sub-acute, much narrowed from the middle to the base; upper surface blackish-brown when dry, the nerves faint: lower warm-brown the nerves and midrib prominent: main-nerves 10 to 14 pairs, rather straight, ascending, interarching ·15 in. from the edge in a bold wavy line; the edges much and irregularly recurved when dry; length 2·25 to 3·5 in.; breadth 1·25 to 2 in.; petiole ·25 to ·3 in. *Panicles* terminal and axillary, as long as or longer than the leaves, on long slender peduncles; branches and branchlets lax, spreading, compressed, with minutely triangular persistent bracteoles at their bases. *Flowers* yellowish-white, sessile, in heads at the ends of the branchlets, small (only ·2 in. long including the stamens), bracteolate at the base. *Calyx* ·15 in. long, funnel-shaped, minutely granular; the mouth with 4 small distant triangular lobes. *Petals* 4, calyptrate. *Fruit* (probably unripe) as large as a pepper-corn, globular, crowned by the wide calyx-limb, white tinged with red.

Malacca: *Griffith* (K.D.) 2410 (*in part*), 2411. *Derry* 3531; *Maingay* (K.D.) 727, 731. Singapore: *Ridley* 2054. Perak: *King's Collector* 5986, 5990, 6627, 8129, 8700, 10417, 10735.

VAR. *obovata; leaves* obovate or obovate-lanceolate.

PERAK: *King's Collector* 6627, 10417, 8129, 8700, 5990, 5986, 8700.

84. EUGENIA SCOPARIA, Wall. Cat. 3594. A tree? Young branches about as thick as a crow-quill, terete, pale-brown, smooth. *Leaves* coriaceous, oblanceolate to obovoid, occasionally elliptic-lanceolate, the apex sub-acute or obtuse, the base always cuneate; upper surface brown and with numerous small pits, the lower paler and with numerous minute black glands, midrib depressed on the upper and prominent on the lower surface, the nerves almost invisible on both; length 1·25 to 2·25 in.; breadth ·6 to 1·1 in. *Panicles* terminal and from the upper leaf axils, longer than the leaves, on slender, rather long, 4-angled peduncles bearing near the apex a few divaricate laxly-flowered branches. *Flower*-buds clavate, about ·15 in. long; mouth of calyx wide, shortly 4-lobed, the tube short and abruptly contracted at the base. *Fruit* almost globular with a truncate apex, smooth, ·1 in. in diam. Duthie in Hook. fil. Fl. Br. Ind. II, 489. *Syzygium scoparium*, Wall. MSS. ? *S. avene*, Miq. Fl. Ind. Bat. Suppl. I, 312.

SINGAPORE: *Wallich.* MALACCA: *Goodenough* 1649.

Specimens of a species nearly allied to this were collected at Changi in Singapore by Mr. Ridley in October 1890 and again at Selangor (Herb. 7555) in 1896. They differ in having the leaves broader, more pronounced obovate, and almost without dots or glands.

85. EUGENIA MYRIANTHA, King n. sp. A tall tree; young branches slightly thicker than a crow-quill, terete. *Leaves* very coriaceous, oblanceolate sub-acute, the base much narrowed; when dry upper surface pale-brown, shining, dotted; the lower darker brown, dull, sub-glaucous; nerves 3 or 4 pairs, on each side very faint, distant, ascending: reticulations on both surfaces invisible, the edges slightly recurved; length 1 to 1·75 in.; breadth ·5 to ·75 in.; petiole ·25 to ·3 in. *Panicles* very numerous, longer than the leaves, terminal or in the upper axils, pedunculate; branches numerous, spreading, the branchlets quadrangular and bearing at their apices numerous small sessile flowers with broad rounded bracteoles at their bases. *Flowers* only ·1 in. long, truncate in bud. *Calyx* cylindric, the mouth very obscurely lobed. *Fruit* unknown.

PERAK: *Scortechini* 337.

A species resembling *E. microcalyx*, Duthie, in its inflorescence and very small flowers and also in the character of the venation of the leaves which however are much smaller.

86. EUGENIA VERECUNDA, Duthie in Hook. fil. Fl. Br. Ind. II, 496. A small tree; young branches as thick as a crow-quill, pale yellow, terete, smooth. *Leaves* thinly coriaceous, ovate, acuminate, the base

broadly cuneate; upper surface brown when dry, shining; the lower very pale brown, dull; the numerous nerves, reticulations and intramarginal nerve rather distinct on both surfaces but especially on the upper when dry; length 2 to 3 in.; breadth ·75 to 1·5 in.; petiole ·35 to ·6 in.; slender. *Panicles* crowded at the apices of the branches and in one or two of the upper leaf-axils, shorter than the leaves, on short peduncles, the branches slender, lax, 4-angled. *Flowers* only ·15 in. long, sessile or on short pedicles, clavate, constricted immediately below the turbinate apex. *Calyx-tube* somewhat ribbed, the wide mouth with 4 shallow distant lobes. *Petals* calyptrate. *Fruit* unknown. *Syzygium verecundum*, Wall. Cat. 3579.

Malacca: *Griffith.* Penang: *Wallich.* Singapore: *Ridley* 9486. Pangkore: *Scortechini* 163.

87. Eugenia Swettenhamiana, King n. sp. A tree, 60 to 70 feet high; young branches thinner than a goose-quill, terete, very pale, faintly striate. *Leaves* thickly membranous, elliptic-oblong to obovate-lanceolate narrowed to the rounded base, the apex shortly and bluntly acuminate; upper surface dark-brown the nerves and midrib impressed; lower surface pale-brown, the midrib and main-nerves prominent; the latter 9 to 12 pairs curved and interarching to form a stout intramarginal nerve ·1 in. from the margin, the reticulations indistinct on both surfaces; length 3·5 to 4 in.; breadth 1·2 to 1·75 in.; petiole ·25 to ·35 in. *Panicles* several together at the ends of the branches, as long (with their peduncles) as the leaves or longer, each bearing near its apex a few slender 3-flowered umbellate branches, the branchlets, peduncle-branches and branchlets compressed and 4-angled. *Flowers* greenish-white, ·35 in. across when expanded; the buds before expansion clavate, ·2 in. long. *Calyx* funnel-shaped, sessile, contracted at the base, its mouth with 4 broad, rounded, deciduous lobes. *Petals* 4, sub-orbicular, free, as large as the calyx-lobes. *Stamens* short. *Fruit* unknown.

Perak: *Scortechini; King's Collector* 7590.

A species near *E. pseudo-subtile*, King, but with oblanceolate leaves and long slender pedunculate umbellate panicles crowded at the apices of the twig. Named to commemorate the help afforded in the Botanical exploration of Perak by Sir Frank Swettenham, K.C.M.G.

88. Eugenia acuminatissima, Kurz in Journ. As. Soc. Beng. XLVI, Pt. 2, 67; Fl. Br. Burm. I, 487. A tree, 20 to 50 feet high; young branches about as thick as a crow-quill, slightly compressed, the bark pale-brown, peeling off in vertical flakes. *Leaves* coriaceous, lanceolate or oblong-lanceolate, the apex caudate-acuminate, the base cuneate; both surfaces pale-brown when dry, the upper tinged with olivaceous, shining, the midrib depressed, the main-nerves 15 to 20 pairs, slightly raised, faint; lower surface darker than the upper, the

nerves faint, the intramarginal line rather less than ·1 in. from the edge; length 2·5 to 4 in.; breadth ·9 to 1·4 in.; petiole ·2 to ·25 in. *Panicles* usually large, lax, many-branched, pedunculate, longer than the leaves, mostly terminal but some also from the upper leaf-axils: branches acutely 4-angled, the upper also compressed. *Flowers* numerous, small, white, sessile, usually in threes from the ends of the branchlets, ·2 in. long (including the stamens). *Calyx* turbinate-clavate, nearly ·2 in. long, the lower half contracted, the upper part turbinate its mouth truncate or very obscurely toothed. *Petals* 5 or 6, minute, rotund, clawed, erose, free. *Fruit* depressed-globular, crowned by the minute circular remains of the calyx, ·4 to ·5 in. broad and about ·35 to ·4 in. long. Duthie in Hook. fil. Fl. Br. Ind. II, 483. *Jambosa acuminatissima*, Hassk. in Flora (1849), 592; Miq. Fl. Ind. Bat. I, 438. *Syzyg. altissimum*, Wall. Cat. 3588. *Myrtus acuminatissima*, Blume Bijdr. 1088.

In all the Provinces except the Nicobar Islands. DISTRIB.—Burma, Sumatra.

89. EUGENIA KUNSTLERI, King n. sp. A tall tree; young branches thinner than a goose-quill, terete, pale. *Leaves* thinly coriaceous, ovate-lanceolate, acuminate, much narrowed at the base: upper surface brown (when dry), with small depressed dots, the nerves indistinct: lower pale-brown with numerous small black dots: main-nerves bold on the under surface, 8 to 10 pairs, curving upwards and interarching ·1 to ·15 in. from the edge; length 3·5 to 5·5 in.; breadth 1·5 to 2·25 in.; petiole ·4 to ·5 in. *Panicles* terminal or from the upper leaf-axils, much shorter than the leaves; the short peduncle and the numerous spreading branches 4-angled, with many small pustules, minutely bracteolate at the divisions. *Flowers* small, numerous, greenish-yellow, in threes at the apices of the branchlets, sessile. *Calyx* ·1 in., funnel-shaped, the mouth with 4 obscure broad teeth. *Petals* orbicular. *Fruit* ovoid, contracted somewhat at the base and crowned by the short wide calyx-limb, smooth, ·5–·6 in. long.

PERAK: *King's Collector* 3310, 3680. PENANG: *Curtis* 179.

A species of which the nearest allies are *E. pustulata*, Duthie, and *E. brachiata*, Roxb., but with more slender panicles and smaller flowers than the former and more acuminate leaves than the latter. It also resembles *E. minutiflora*, Miq., but that has broadly ovate shortly acuminate leaves and shorter panicles.

90. EUGENIA PUSTULATA, Duthie in Hook. fil. Fl. Br. Ind. II, 495. A tree, 20 to 50 feet high; young branches thinner than a goose-quill, terete, pale-brown, minutely warted. *Leaves* coriaceous, oblong or oblong-lanceolate, shortly acuminate, much narrowed to the base: upper surface (when dry) smooth, shining, greenish, the nerves usually

indistinct; the lower brown with many minute papillæ especially on the prominent midrib; main-nerves 10 to 14 pairs, curving upwards and interarching ·1 in. from the margin, pale, and prominent on the lower surface; length 4·5 to 7 in.; breadth 1·35 to 2·25; petiole ·3 to ·4 in. *Panicles* small, several together, shorter than the leaves, terminal or from the upper leaf-axils, branching from the base, the branches spreading, papillose, stout, 4-angled. *Flowers* few, sessile, ·25 in. long (including the stamens), truncate in bud. *Calyx* campanulate, minutely papillose externally; the mouth wide and with 4 short, broad, sub-acute lobes. *Petals* calyptrate. *Fruit* globular, the apex with a circular pit surrounded by the wide, short, cupular remains of the calyx, smooth, ·4 to ·5 in. in diam.

Malacca: *Maingay* (K.D.) 751. Singapore: *Ridley* 4657, 4979, 6420, 6421. Perak: *King's Collector* 3724, 6758, 7536.

A species recognisable by its short stout panicles with short widely campanulate flowers, and pustulate stems and panicles. The leaves (when dry) are distinguished by their colour, greenish above and brown beneath.

91. Eugenia Koordersiana, King n. sp. A tree, 40 to 80 feet high; young branches somewhat thicker than a crow-quill, terete, dark purplish-brown when dry. *Leaves* coriaceous, elliptic or narrowly ovate, rarely oblanceolate, shortly caudate-acuminate, the base cuneate; both surfaces (when dry) very dark brown, the lower slightly paler; main-nerves 8 to 10 pairs, curving slightly and interarching ·1 in. or more from the edge, impressed on the upper surface slightly prominent on the lower; length 2·75 to 3·75 in.; breadth 1 to 1·75 in.; petiole about ·3 in. *Panicles* terminal, usually much longer than the leaves, corymbose, many-branched, the peduncle and branches sharply 4-angled, compressed at the nodes; branchlets 3- to 5-flowered at the apex. *Flowers* white, clavate in bud, sessile. *Calyx* campanulate, 4-angled, ·15 in. long, contracted for half its length into a pseudo-stalk; the mouth with 4 deep, broad, rounded lobes. *Petals* 4, sub-rotund, calyptrate. *Fruit* unknown.

Perak: *Scortechini* 257; *King's Collector* 6208, 6233, 6385.

When dry the leaves and panicles of this are very dark-coloured. It is allied to *E. pseudo-subtilis* and *E. Clarkeana*, but differs from both in leaves. I have named it in honour of Dr. S. H. Koorders of the Forest Dept. in Netherlands India.

92. Eugenia simulans, King n. sp. A tree, 30 to 40 feet high, with pendulous branches: young branches terete, the very youngest compressed and about as thick as a crow-quill, brown. *Leaves* thinly coriaceous, oblong or elliptic-lanceolate, shortly and rather bluntly acuminate, the base cuneate; both sides dark-brown and shining when dry, the lower paler and duller, slightly olivaceous; nerves numerous,

straight, inconspicuous like the reticulations, intramarginal nerve very near the edge; length 4·5 to 5·5 in.; breadth 1·75 to to 2·25 in.; petiole ·3 to ·4 in. *Panicles* mostly axillary, sometimes terminal, 3 to 4 in. long, pedunculate, pyramidal, the branches nearly horizontal, all terete. *Flowers* mostly in threes at the apices of the branchlets, sessile, clavate in bud. *Calyx* nearly ·15 in. long, obconic, with a sub-obtuse base; the mouth thickened, undulate, indistinctly 5-toothed. *Petals* calyptrate. *Stamens* unequal. *Fruit* unknown.

PERAK: *Scortechini* 83, 274.

This resembles *E. Bernardi*, King, but differs in having clavate, not shortly obovoid, flower-buds, and in its panicles being usually lateral not terminal. The leaves of the two are much alike. Ridley's specimens collected in the garden jungle (8104 and 9845) probably belong to this but the panicle is laxer and its branches thinner.

93. EUGENIA CURTISII, King n. sp. A tree, 60 to 80 feet high; young branches thinner than a goose-quill, terete, the bark brown and peeling off in flakes. *Leaves* coriaceous, oblong-lanceolate or oblong-elliptic, rarely oblanceolate, the apex shortly and bluntly acuminate, the base cuneate, the edges slightly recurved when dry, both surfaces when dry pale olivaceous-brown, shining, obscurely pustulate, the lower less shining and darker in colour than the upper and with numerous very distinct minute conical concolorous pustules; the midrib depressed on the upper but prominent and pustulate on the lower surface; main and secondary nerves numerous, spreading, interarching less than ·1 in. from the slightly recurved edge, rather distinct on the lower but faint on the upper surfaces; length 3 to 5·5 in.; breadth 1 to 2 in.; petioles ·15 to ·2 in. *Panicles* terminal, from half as long as to as long as the leaves, branched from the base, dense, many-flowered, broader than long, the main-branches spreading, terete, the secondary and tertiary acutely 4-angled, all stout, the bark very granular, ultimately flakey. *Flowers* crowded at the ends of the branchlets, ·2 in. long (including the stamens), sub-globose in bud. *Calyx* campanulate, narrowed to the base and produced into a short pseudo-stalk, granular, shining: the mouth wide, with 5 small, broadly triangular teeth. *Petals* 5, papillose outside, orbicular, ? calyptrate. *Fruit* unknown.

PERAK: *Wray* 2968, 3102; *King's Collector* 6149.

VAR. *minor; flowers* smaller (rather less than ·2 in. long, including the stamens): *Calyx* not produced into a pseudo-stalk, its mouth obscurely lobed: leaves 2·5 to 3 in. long.

PERAK: *Wray* 194. MALACCA: *Harvey*.

94. EUGENIA OPERCULATA, Roxb. Hort. Beng. 37; Fl. Br. Ind. II, 486. A tree, 30 to 50 feet high; young branches slightly compressed, dotted and grooved at first, afterwards terete, the bark pale-brown at first but

ultimately grey. *Leaves* thinly coriaceous, variable in shape, ovate-oblong to elliptic and (in VAR. 2) obovate, shortly acuminate, bluntly apiculate or (in VAR. 2) obtuse, the base cuneate; both surfaces olivaceous when dry, the lower paler and minutely dotted: main-nerves distinct on the lower surface, 8 to 12 pairs, curved, ascending, becoming faint towards the intramarginal nerve: length 4 to 6 in.; breadth 1·6 to 2·2 in.; petiole ·2 to ·3 in. *Panicles* from the branches below the leaves, 2 or 3 inches long, pedunculate, spreading, lax; the branches divaricate, trichotomous, 4-angled. *Flowers* in threes at the apices of the branchlets, greenish, sessile. *Calyx* smooth, campanulate, contracted at the base; the limb truncate. *Petals* 4, calyptrate, orbicular, concave, about ·1 in. across. *Fruit* pisiform, smooth, very dark purple, pulpy, 1-seeded. Wight Ic. t. 552; Brandis For. Fl. 234; Kurz For. Fl. I, 483; Duthie in Hook. fil. Fl. Br. Ind. II, 498. *E. cerasoides*, Roxb. Hort. Beng. 92; Fl. Ind. II, 488; Wight Ic. t. 615; Miq. Anal. Bot. Ind. I, 27; Fl. Ind. Bat. I, Pt. 1, 443; Kurz in Journ. As. Soc. Beng. XLVI, Pt. 2, 66; For. Fl. I, 484. *Syzygium nervosum*, DC. Prodr. III, 260; Mem. Myrt. II, 16; Wall. Cat. 3551 A & B; 3553 B & C (under *E. ribesioides*); Benth. Fl. Hongk. 119; Thwaites Enum. 417; Miq. Fl. Ind. Bat. *l.c.* 460 Bedd. Fl. Sylv. Anal. Gen. CVI. *S. costatum*, *nodosum*, and *angkolanum*, Miq. Fl. Ind. Bat. *l.c.* 448. *Calyptranthes mangiferifolia*, Hance in Walp. Ann. II, 629. *C. costata*, Ham. in Wall. Cat. 3556. *C. grandis* and *C. Tatna*, Ham. in Wall. Cat. 3554, 3555.

PERAK: *Scortechini* 306. PENANG: *Curtis* 1444. DISTRIB.—British India, S. China and the Malay Archipelago.

Two varieties have been separated off but I have no specimens of either from any of the Provinces in our region. These are described as follows by Mr. Duthie in Hooker's Flora of British India.

VAR. *Paniala*; berries oval. *E. Paniala*, Roxb. Fl. Ind. II, 489; Wight Ic. t. 616; Kurz For. Fl. I, 483. *Syz. Panealla*, Wall. Cat. 3557? *Calyptranthes cuneata*, Ham.?

VAR. *obovata*, Kurz For. Fl. I, 482; leaves obovate or oblanceolate, cymes more compact. *Syz. obovatum*, Wall. Cat. 3552, not of DC. *S. vastum*, Wall. Cat. 3661. *S. polyanthum*, Thwaites; not of Wight.

A third variety occurs in Perak but it has as yet been only once collected. It may be distinguished as follows.

VAR. *coriacea*; *leaves* thicker than in the type and not dotted or very obscurely dotted on the lower surface.

PERAK: *Wray* 2725, at Matong on the sea-coast.

95. EUGENIA NICOBARICA, King. A tree? Young branches rather thinner than a goose-quill, terete, somewhat rough, grey. *Leaves* thinly coriaceous, lanceolate or elliptic, the apex sub-acute, the base cuneate;

both surfaces (when dry) olivaceous-brown, the upper shining, with the midrib and main-nerves depressed; the lower paler and dull; main-nerves 5 to 8 pairs, faint on both surfaces; reticulations few, faintly visible on the lower invisible on the upper surface; length of the lanceolate form 2·5 to 3 in., of the elliptic form 3 to 4·5 in.; breadth respectively 1 to 1·5 in. and 1·5 to 2·5 in.; petiole ·6 to ·8 in. *Panicles* numerous, crowded on the branches below the leaves, trichotomous, 1 to 2 in. long, with a few divaricating, few-flowered branches. *Flowers* in threes at the ends of the branchlets, ·25 in. long (including the stamens), sessile or on short, stout 4-angled pedicels, obovoid in bud. *Calyx* ·1 in. long, lengthening to ·2 in. after fertilization, campanulate with a 4 in. wide, truncate, irregularly toothed thickened mouth, much narrowed to the base but not constricted into a pseudo-stalk. *Petals* 4 orbicular, calyptrate. *Fruit* unknown. *E. occlusa*, Kurz in Hook. fil. Fl. Br. Ind. II, 498 (not of Miquel).

Nicobar Islands: *Kurz.*

This has been collected only in the Nicobar islands and there only by Kurz who referred it to *Syzygium occlusum*, Miq. But it differs so much from an authentic specimen of that species in the Horsfield collection and from Miquel's own description, that I have given it a new name.

96. Eugenia Jambolana, Lamk. Dict. III, 198. A small tree; young branches thinner than a goose-quill, terete, very pale when dry. *Leaves* coriaceous, rather variable, rotund-ovate to oblong-ovate, bluntly and shortly acuminate, sub-acute or obtuse, slightly narrowed at the base; both surfaces brown when dry, the under paler; nerves and their connecting reticulations numerous, distinct when dry on both surfaces but especially on the lower, intra-marginal nerve and midrib prominent on the lower; length 2·5 to 4 in.; breadth 1·5 to 2·25; petiole ·6 to ·75 in. *Panicles* from the branches below the leaves, much branched; the branches divaricate, all terete, many-flowered, longer than the leaves. *Flowers* whitish, sessile, ·4 in. across. *Calyx* campanulate, suddenly contracted into a stout pseudo-stalk less than half its length, the limb at first obscurely and broadly 4-toothed but ultimately truncate. *Petals* 4, orbicular, rather more than ·1 in. long, calyptrate. *Fruit* ovoid-oblong, about the size of an olive, pulpy, smooth, dark-purple, 1-seeded. Ham. in. Wern. Soc. Trans. V, 342; Roxb. Fl. Ind. II, 484; Wight Ic. t. 535; Benth. Fl. Austral. III, 283; Bedd. Fl. Sylv. I, t. 197; Brandis For. Fl. 233; Kurz in Journ. As. Soc. Beng. XLVI, Pt. 2, 67; For. Fl. I, 485. Duthie in Hook. fil. Fl. Br. Ind. II, 499. *Syz. Jambolanum*, DC. Prodr. III, 259; Wall. Cat. 3560; W. and A. Prodr. I, 329; Dalz. and Gibs. Fl. Bomb. 93. *E. frondosa*, Wall. Cat. 3560 G: not 3590. *E. Moorei*, F. Muell. Fragm. V, 33. *Calyptranthes Jambolana*, Willd. Sp. Pl. II, 975. *C. capitellata*,

Ham. in Wall. Cat. 3560 B. *E. caryophyllifolia*, Lam. Dict. III, 198; Roxb. Hort. Beng. 37; Fl. Ind. II, 486; Wight Ic. II, 553. *E. calyptrata*, Roxb. Ic. 1142? *Syz. caryophyllifolium*, DC. Prodr. III, 259; Wall. Cat. 3562 partly, and 3551, C.; Thwaites Enum. 116. *S. Jambolanum*, var. *microcarpum*, Thwaites Enum. 417; Wall. Cat. 3562 C. *Syz. lateriflorum*, Royle. *Myrtus Cumini*, Linn.: exclude syn. Rumph. and Burm.—Pluk. Alm. t. 274, 2. Rheede Hort. Mal. V, t. 29. Rumph. Herb. Amb. I. t. 41. *E. obtusifolia*, Roxb. Hort. Beng. 37; Fl. Ind. II, 485; Wight Ic. t. 620. *Jambolifera pedunculata*, Gaertn. Fruct. I, 78, t. 36.—Rumph. Herb. Amb. I, t. 42; (bad).

Not uncommon in cultivation in all the provinces and also in British India but rarely wild in any of the Malay provinces. The fruit although rather austere is eaten.

Species of doubtful position.

The under-noted three species were described by Mr. Duthie in Hooker's Flora of British India. They are all founded on scanty specimens collected by Maingay. I quote the author's descriptions *verbatim*.

E. fusiformis, Duthie; young branches 4-gonous, leaves petioled obovate-lanceolate cuneate below subcoriaceous pellucid-punctate, lateral nerves rather close, cymes terminal compact branches angular and somewhat winged, flowers 2 or 3 together on short pedicels, calyx-tube narrowly fusiform much produced above the ovary.

Malaya: *Maingay* 743.

Bark yellowish. *Leaves* 4½ by 3 in., shining a little above, minutely dotted; midrib and nerves dark-coloured; lateral nerves uniting within the margin; petiole about ⅜ in. *Calyx-tube* ⅛ in. in length and ⅛ in. across at the widest part; lobes 4, rounded, reflexed after flowering. *Style* persistent, exserted portion equalling the calyx-tube.—Closely allied to 2236 of Beccari's Borneo plants.

E. maingayi, Duthie; leaves shortly petioled long oblong-lanceolate acuminate rounded at the base, racemes short axillary or from the leafless axils of the rugged lower branchlets, calyx-tube elongate clavate about ⅖ in. glandular, lobes 4 rounded deciduous.

Malaya: *Maingay* 750.

Older branchlets with rugged corky bark, upper stout, terete, reddish. *Leaves* 4½–7½ by 1⅜–2¼ in., indistinctly nerved above, midrib stout beneath; petiole ⅛ in. *Style* short, acute.—This plant seems to approach nearest to *E. claviflora*, and has a general resemblance to *E. borneensis*, Miq. Fl. Ind. Bat. I, Pt. 1, 434 (*Jambosa*), but the petioles of the latter are much longer.

E. tumida, Duthie; leaves oblong-ovate or obovate shortly acuminate narrowed at the base closely nerved, cymes terminal and axillary equalling or exceeding the leaves, calyx-tube $\frac{3}{10}$ in. narrow swollen below the middle.

Malacca: *Maingay* 755.

Branchlets terete. *Leaves* 2½–3½ in., chocolate-coloured above, rusty-yellow beneath when dried; lateral nerves slender, uniting close within the margin; petiole ¼ in. *Panicles* lax, spreading; branches acutely angular. *Calyx* with 4 nearly equal shallow lobes.—The *petals* are probably free, though not expanding. The swollen part of the calyx-tube is occupied by the ovary.

9. Pseudo-eugenia, Scortechini.

Trees with opposite punctate leaves and few-flowered, axillary, minutely bracteolate inflorescence. *Calyx-tube* turbinate or oblong, its mouth with 4 small rounded lobes, and bearing a thin annular staminiferous disc. *Petals* 4, orbicular, clawed. *Stamens* 8, in two rows; filaments inflexed in bud; *anthers* small, 2-celled. *Ovary* 2-celled. *Style* short. *Ovules* numerous, in several series on the placentas. *Fruit* as in *Eugenia*, 1- to 2-seeded. Distrib.—2 species, both Malayan.

A genus which differs from *Eugenia* chiefly in having only 8 stamens.

Leaves 4·5 to 6 in. long	1. *P. perakensis.*
„ 1·5 to 2·5 in. long	2. *P. singaporensis.*

1. Pseudo-eugenia perakensis, Scortechini in Journ. Bot. XXIII (1885), 153. A tree, 15 feet high; young branches thin, terete. *Leaves* thinly coriaceous, elliptic-lanceolate, slightly narrowed at the base, the apex with a slender obtuse acumen, pellucid-punctate, the main-nerves close, inconspicuous on the upper surface, sub-horizontal, interarching near the margin; length 4·5 to 6 in.; breadth 1·5 to 2 in.; petioles short. *Calyx-lobes* incurved. *Petals* 4, small, free, spreading, distant. *Stamens* short. *Berry* pisiform. *Eugenia skiophila*, Duthie in Hook. fil. Fl. Br. Ind. II, 486.

Penang: *Maingay.* Perak: *Scortechini.*

2. Pseudo-eugenia singaporensis, King n. sp. A tree, 30 to 40 feet high; young branches as thin as a crow-quill or thinner, terete, smooth, dark-brown. *Leaves* thinly coriaceous, elliptic-lanceolate, slightly narrowed at the base, the apex abruptly and bluntly acuminate; both surfaces (when dry), dull and of a uniform dark-brown colour; the upper with the midrib depressed and the main-nerves and reticulations obscure; the lower minutely warted; the main-nerves numerous, faint, interarching near the edge; length 1·5 to 2·5 in.; breadth ·45 to ·7 in.; petioles ·1 to ·15 in. *Panicles* shorter than the leaves, axillary, few-branched and few-flowered; the peduncle and branches very slender, dark coloured, 4-angled. *Flowers* clavate in bud and greenish. *Fruit* unknown.

Singapore: *Ridley* 2909; *King's Collector* 1242, 5957, 8710.

Note.

In addition to the two species above described there are in the Calcutta Herbarium specimens of what appears to be a third species of this genus collected by Mr. Harvey near Malacca. In these specimens the leaves are ovate with acute apices and cuneate bases, and 5 to 7 pairs of ascending main-nerves rather prominent on the lower surface. The leaves are from 3 to 4 inches long and about half as much in breadth. The flowers measure about ·3 in. in length and rise in pairs from the stems below the leaves. Mr. Forbes also collected in Sumatra specimens (Herb. *Forbes* 2889) of a small tree with elliptic, caudate-acuminate leaves

cuneate at the base, which probably belong to a fourth species of *Pseudo-eugenia*. The flower-buds of this, which measure less than ·1 in. in length, are borne in pairs below the leaves.

10. Barringtonia, Forst.

Trees. *Leaves* alternate, crowded towards the ends of the branches, entire or slightly crenate-serrate, pinnate-nerved, not dotted. *Flowers* in elongated terminal and lateral racemes, or in interrupted spikes; bracts small, deciduous. *Calyx-tube* ovoid or turbinate, scarcely produced above the ovary; lobes 2–4, valvate, or 3–5, imbricate. *Petals* 4 rarely 5, much imbricate, somewhat adnate at the base to the staminal tube. *Stamens* numerous, in several series, connate into a short tube at the base; filaments filiform, long, all bearing anthers. *Ovary* inferior, 2–4-celled, crowned by an annular disc; style long, filiform, simple, stigma small; ovules 2–8 in each cell, pendulous. *Fruit* fibrous or somewhat berried, globose, ellipsoid or quadrangular, crowned by the calyx, by abortion 1-seeded. *Seed* ovoid or ellipsoid, without albumen; embryo large, exhibiting two layers, cotyledons nearly obsolete. Distrib.—Species 25; in tropical Asia, Africa, Australia and Polynesia, often near the sea.

Sect. I. Butonica. Calyx closed in bud and entire, ultimately splitting into 2 or sometimes into 3 lobes: flowers pedicelled.

Racemes short, erect or sub-erect; fruit conical.

Racemes terminal, erect; flowers 2·5 to 3 in. long and of greater diameter; fruit angled but not winged at the base ... ... 1. *B. speciosa.*

Racemes lateral or terminal, sub-erect; flowers less than 1 in. in diam.; fruit with 8 downward-pointing wings at the base ... ... 2. *B. conoidea.*

Racemes elongated, pendulous; fruit ovoid ... 3. *B. racemosa.*

Sect. II. Stravidium. Calyx with 4 (sometimes 3 or 5) imbricate lobes.

Racemes terminal, erect, short, 1- to 3-flowered 4. *B. pauciflora.*

Racemes lateral, pendulous, elongate, many-flowered.

Flowers more than ·5 in. across; leaves with distinct petioles from 7·5 to 3 or 4 in. in length.

Flower-buds just before expansion about ·25 in. long; fruit ovoid or elliptic, not angled or only slightly so; rachis much thickened in fruit ... 5. *B. macrostachya.*

Flower-buds just before expansion more than ·25 in. long; fruit oblong, 4-angled.

Main-nerves of leaves 6 or 7 pairs; fruit 3 in. long; rachis of spike thickening slightly in fruit 6. *B. Scortechinii.*

Main-nerves of leaves 9 to 12 pairs; fruit glabrous, acutely 4-angled, less than 2 in. long; rachis of spike hardly thickening in fruit ... 7. *B. sumatrana.*

Main-nerves of leaves 8 to 12 pairs; fruit minutely pubescent, 4 or 5 in. long; rachis of spike thickening much in fruit ... ... 8. *B. musiformis.*
Flowers less than ·5 in. across; leaves sessile or with very short petioles.
Flowers pedicelled:—
Fruit fusiform ... ... 9. *B. fusiformis.*
Fruit, oblong truncate, boldly 4-angled ... 10. *B. acutangula.*
Flowers sessile or nearly so; fruit sub-globose 11. *B. spicata.*

1. BARRINGTONIA SPECIOSA, Forst. Char. Gen. t. 38 and t. 38 A and B. A glabrous tree, 30 to 50 feet high; young branches stout, grey. *Leaves* thinly coriaceous, obovate-oblong or obovate, with broad rounded apex and much narrowed base, sessile, entire; main-nerves about 10 pairs, not prominent; length 6 to 14 in.; breadth 3·5 to 7 in. *Panicles* short (4 to 8 in. long) erect, terminal, with 1 or 2 leaf-like bracts at the base, few-flowered. *Flowers* 6 to 12, large (2·5 to 3 in. long and 5 in. in diam.), on long pedicels bracteolate at the base. *Calyx* with 2 large oblong, nerved (2 to 4 in.) lobes ·75 to 1·25 in. long, persistent. *Petals* 4, white, larger than the calyx, (2·5 in. broad) deciduous. *Stamens* very numerous, longer than the petals but shorter than the style. *Fruit* large, shining, quadrangular-truncate at the base, tapering to the apex and crowned by the persistent calyx, bluntly 4-angled, sometimes sub-ovoid and less prominently angled, 3 in. or more in breadth at the base and slightly more in length; pericarp very thick, fibrous, spongy. *Seeds* ovoid, 2 or more in. long. Flor. des Serres IV, 409; Linn. f. Suppl. 312; DC. Prodr. III, 288; Roxb. Fl. Ind. II, 636; Wall. Cat. 3632, excl. B; Blume Bijdr. 1096; W. & A. Prodr. 333; Wight Ic. t. 547; Miq. Fl. Ind. Bat. I, Pt. 1, 485; Miers in Trans. Linn. Soc. Ser. II, Bot. 1, 55, t. 10; Kurz For. Fl. I, 496; Clarke in Hook. fil. Fl. Br. Ind. II, 507; Trimen Flora Ceylon II, 189. *B. asiatica*, Kurz in Journ. As. Soc. 1877, Pt. 2, 70. *B. ? macrophylla*, Miq. *l.c.* 491. *Mammea asiatica*, Linn. Sp. Pl. 731. *Agasta splendida, asiatica* and *indica*, Miers *l.c.* 60–64, tt. 11, 12. *Butonica*, Rumph Herb. Amb. III, t. 114.

In all the Provinces, on the sea-coasts: DISTRIB.—The shores of the Malay islands and British India; also of Australia and Polynesia.

The late Mr. Miers excluded from the genus *Barringtonia* everything except a plant now known by an imperfect specimen preserved in the Banksian collection and by Forster's drawings, which latter represent a 4-celled fruit. The plant here described to which Forster's name had, prior to the issue of Mr. Miers' monograph in the Linnæan Transactions, by common consent been given, is one of three forms of the plant on which Miers founded the genus *Agasta*. On characters largely based upon slight differences in the shape of the fruit, Miers distinguished his three species *Agasta splendida, asiatica* and *indica*. The latest writers on

Indian Botany who have dealt with the Indian *Barringtonias* (Mr. C. B. Clarke in Hooker's Flora of British India, and the late Dr. H. Trimen in his Flora of Ceylon) adopt the view that obtained prior to the publication of Miers' paper, and they believe that the three species of *Agasta* of the latter author are merely forms of the *Barringtonia speciosa* of Forster. If Miers' arrangement, however, is to be followed, the name of the plant occurring on the coasts of the Malay Peninsula and of British India would be either *Agasta indica* or *A. asiatica* according to the shape of the base of the fruit. Miers says of the fruit of the form which he considers alone entitled to the name *Barringtonia speciosa, fructus non vidi*, and he relies solely on Forster's figure (Char. Gen. t. 38 B, fig. *b*). In his account of it that figure no doubt shows a 4-celled fruit. Whether or not Forster or his artist had a fully-developed fruit before him when he made the drawing referred to cannot be known. But however that may be, the characters, other than the number of cells in the fruit of Forster's *Barringtonia* and of Miers' three *Agastas* are practically alike, and I fail to see any good basis for the foundation on them of four species belonging to two genera.

2. Barringtonia conoidea, Griff. Notul. 656. Ic. 635, 636, fig. 1. A large bush or small tree, glabrous; young branches sub-sulcate. *Leaves* thickly membranous, oblanceolate-elliptic or cuneate: oblong, narrowed at the minutely subcordate or rounded base to the short, stout petiole; the apex blunt or sub-acute; the edges obscurely crenate-serrulate or subentire; main-nerves 9 to 13 pairs, curved, ascending; length 4·5 to 10 in.; breadth 2 to 4 in.; petiole ·15 to ·2 in. *Racemes* suberect, lateral or terminal, few-flowered, about 4 in. long, glabrous or puberulous. *Flowers* less than 1 in. long and 1 in. across, on pedicels ·5 to ·6 in. long. *Calyx* with a subcylindric tube, ·15 in. long; the base with 8 gibbous processes; the limb bipartite. *Petals* 4, fleshy, ovate-lanceolate. *Stamens* much exceeding the corolla. *Fruit* fibrous-fleshy, conoid, produced at the base into 8 wing-like semi-cordate fleshy processes and crowned at the apex by the calyx, 2·5 in. long and 1·75 in. broad at the base. Kurz For. Flor. Burma I, 497; Clarke in Hook. fil. Fl. Br. Ind. II, 508. *B. alata*, Wall. Cat. 3633. *Butonica alata*, Miers in Trans. Linn. Soc. Ser. II, Bot. I, 70, t. 14, figs. 10 to 15.

Malacca: *Griffith* (Kew Dist. 2423). Perak: *Scortechini* 1385. Burmah: *Wallich*.

At once distinguished by its curious conical fruit winged at the base.

3. Barringtonia racemosa, Roxb. Hort. Beng. 52; Fl. Br. Ind. II, 634. A glabrous tree, often 50 feet high; young branches rather stout, cinereous. *Leaves* membranous, oblong-obovate or oblanceolate, shortly acuminate, narrowed to the shortly petiolate base, faintly crenate-denticulate; main-nerves 8 to 15 pairs, spreading or ascending, thin but prominent on the lower surface when dry; length 4 to 12 in.; breadth 2 to 4 in.; petiole ·1 to ·25 in. *Racemes* much longer than the leaves, (10 to 24 in. long) from the axils of fallen leaves or terminal,

pendulous, many-flowered, minutely bracteolate. *Flowers* distant, 1·5 to 2 in. in diam., on thin pedicels ·2 to ·3 in. long, buds globose. *Calyx* turbinate, obconic, 2- or 3-partite, permanent. *Petals* 4, oblong. *Stamens* very numerous, much longer than the calyx but shorter than the style. *Fruit* as large as a hen's egg and of much the same shape, but somewhat 4-sided, nearly smooth, the pericarp leathery; seed solitary ovate-oblong. DC. Prodr. III, 288; Wall. Cat. 3634; W. & A. Prodr. 333; Wight Ic. t. 152, including fruit; Bot. Mag. t. 3831; Dalz. & Gibs. Bomb. Fl. 94; Gaud. Voy. Freyc. t. 107; Vidal, F. Fl. Fil., t. 50*a*; Kurz For. Fl. I, 496; Clarke in Hook. fil. Fl. Br. Ind. II, 507; Trimen Flora Ceyl. II, 189. *B. speciosa*, Wall. Cat. 3632 B. *B. alba*, Miq. Fl. Ind. Bat. I, Pt. 1, 487. *Eugenia racemosa*, Linn. Sp. Pl. 673. *Stravidium album*, DC. Prodr. III, 289. *Butonica racemosa* and *alba*, Miers in Trans. Linn. Soc. Ser. II, Bot. I, 65, 66, t. 13, figs. 1–17. *B. rubra* and *inclyta*, Miers *l.c.* 70, 71, t. 14, figs. 1–3, 19.—Rheede Hort. Mal. IV, t. 6.

In all the provinces; on the sea shores. DISTRIB.—Brit. India, Malayan Archipelago, Polynesia.

4. BARRINGTONIA PAUCIFLORA, King n. sp. A tree, 30 or 40 feet high; young branches slender, glabrous, pale-brown when dry. *Leaves* thickly membranous, broadly oblanceolate narrowed into the petiole at the base; the apex suddenly and shortly caudate-acuminate; main-nerves 8 to 10 pairs, curving upwards; length 3 to 4·5 in.; breadth 1·25 to 2 in.; petiole ·4 to ·8 in., slender. *Raceme* solitary, terminal, erect, 1·5 to 2 in. long, bearing only 2 or 3 flowers or sometimes only a single one. *Flowers* about 1·75 in. long. *Calyx-tube* funnel-shaped, boldly 4-angled, sparsely rufous-furfuraceous, ·4 in. long; the lobes 4, ovate-rotund, blunt, shorter than the tube. *Petals* 4, obovate-oblong, glabrous, 1 in. long. *Stamens* longer than the petals. *Fruit* unknown.

PERAK: *Scortechini* 939; *King's Collector* 6355.

5. BARRINGTONIA MACROSTACHYA, Kurz in Journ. As. Soc. Beng. XLVI, Pt. 2, 71; For. Flora Burma II, 498. A glabrous shrub or small tree; young branches pale-brown, striate. *Leaves* oblong-oblanceolate or oblong-elliptic, narrowed to the long slender petiole, the apex abruptly acuminate, the edges entire or with broad shallow crenations; main-nerves 14 to 18 pairs, curved, ascending, rather prominent beneath when dry; length 5 to 12 in.; breadth 2 to 5 in.; petiole 1 to 4·5 in. *Spikes* lateral (often extra-axillary) or terminal, pendulous, 1 to 2 feet long, glabrous or puberulous, stout, rather fleshy and much thickened in the fruiting stage; bracteoles minute, caducous. *Flowers* sessile, crowded, nearly 2 inches long and 1 in. across when expanded. *Calyx-tube* obconic, 4-angled, ·25 in. long; the limb with 4 broad, blunt lobes

·2 in. long. *Petals* oblong sub-acute, 1 in. long. *Filaments* twice as long as the petals. *Fruit* broadly-ovoid or elliptic, smooth, not angled or only slightly so, crowned by the small calyx-lobes, 1·5 to 2 in. long and about 1·35 in. in diam. Clarke in Hook. fil. Fl. Br. Ind. II, 509 (excl. syn. *B. pendula*, Kurz and *Doxomma pendula*, Miers). *B. cylindrostachya*, Griff. Notul. IV, 655. *B. sarcostachys*, Miq. Fl. Ind. Bat. I, Pt. 1, 490. *Stravidium sarcostachys*, Blume in Van Houtte Fl. des Serres, VII, 24. *S. acuminatum*, Wall. Cat. 3636. *Doxomma macrostachyum*, *cylindrostachyum*, *acuminatum*, Miers in Trans. Linn. Soc., Ser. II, Bot. I, 104, 100, 102. *Careya macrostachya*, Jack in Mal. Misc. I, 47; DC. Prodr. III, 295.

Malacca: *Maingay* (K.D. 763); *Griffith* (K.D. 2421): Penang: *Curtis* 1581. Negri Sembilan: *Ridley* 1852. Perak: *Scortechini* (without No.); *Wray* 1299, 2410, 3136, 3642, 3635; *King's Collector* 3402, 3779, 4136, 10075, 10206, 10615. Distrib.—Borneo, Burmah, *Griffith*; *Gallatty*.

This is allied to *B. pendula*, Kurz—a rare species from Southern Burma originally described by Griffith as *Careya pendula* (Notulæ IV, 661). That species, however, has narrower leaves than this with fewer nerves; the calyx-tube is elongate, the stamens are only about one inch long; and the fruit is narrowly oblong, boldly 4-angled, more than 2 in. long and only about ·65 in. in diam. There is an excellent drawing of this plant with full analyses of the flowers in the Herb. Kew, which was made from living specimens by the Rev. C. Parish. The species has been reduced in Hooker's Flora of British India to *B. macrostachya* from which it differs in the points above noted.

6. Barringtonia Scortechinii, King n. sp. A glabrous tree, 50 to 60 feet high; young branches slender, pale-brown, glabrous. *Leaves* thinly coriaceous, elliptic-oblong to oblanceolate-oblong, tapering (often very much) to the petiole; the apex acute or shortly acuminate; the margins entire or obscurely and minutely dentate; main-nerves 6 or 7 pairs, spreading, curved; length 3 to 6·5 in.; breadth 1·5 to 2·5 in.; petiole ·5 to ·8 in. *Spikes* lateral, pendulous, 6 to 18 in. long, glabrous, rather slender but slightly thickening with age. *Flowers* numerous, 1·5 to 2 in. long, narrow. *Calyx-tube* bracteate at the base, glabrous, obconic, 4-angled, ·25 in. long; the 4 lobes shorter than the tube, broad, rounded. *Petals* oblong, blunt, ·75 in. long. *Filaments* 1·5 to 2 in. long. *Ovary* 3-celled (usually). *Fruit* oblong, somewhat tapered but truncate at each end: the apex mamillate crowned by the small calyx-lobes, smooth, 3 in. long and 1 in. diam.

Perak: *Scortechini* 237, 395, 1674, 2020; *Wray* 2087; *King's Collector* 3598, 3854, 6252; *Curtis* 1296.

There are two distinct forms under this species; one with oblong-elliptic

leaves and rather larger flowers; the other with leaves oblanceolate, more slender spike-rachis and smaller flowers, but the two pass into each other.

7. BARRINGTONIA SUMATRANA, Miq. Fl. Ind. Bat. Suppl. 315. A glabrous tree; young branches pale, as thick as a goose-quill. *Leaves* coriaceous, elliptic or oblong-elliptic tapering much to the base, the apex shortly and rather abruptly acuminate, the edges obscurely serrate or entire, slightly wavy somewhat recurved when dry; upper surface shining when dry, the lower dull and paler, both minutely reticulate; main-nerves 9 to 12 pairs, thin but prominent; length 4·5 to 7·5 in.; breadth 1·4 to 3 in.; petiole ·75 to 2 in., thickened at the base. *Spikes* axillary and terminal, pendulous, angled, glabrous, 9 to 15 in. long, not thickening in fruit. *Flowers* numerous, more than 1 in. long and nearly as much across, sessile. *Calyx* ·5 in. long; the tube infundibuliform acutely 4-angled; the lobes half as long as the tube, broadly ovate, concave, spreading. *Petals* broadly oblong, very blunt, ·65 in. long. *Stamens* ·75 in. long or more. *Style* slender, 1·6 in. long. *Fruit* oblong, somewhat tapered to the base, less so to the calyx-crowned apex, acutely 4-angled, smooth and shining, 1·75 in. long, and ·65 in. in diam.

SINGAPORE: *Ridley* 277, 2056. SUMATRA: *Miquel* (Herb. Bogor 4536). CELEBES: *Beccari*.

8. BARRINGTONIA MUSIFORMIS, King n. sp. A large tree, 60 to 80 feet high; young branches as thick as the fore finger, brownish, glabrous. *Leaves* thinly coriaceous, entire, or obscurely crenate towards the apex, oblong-oblanceolate or narrowly elliptic-oblong, much tapered to the long slender petiole, the apex shortly acuminate; main-nerves 8 to 12 pairs, curved, ascending, not conspicuous; length 5 to 10 in.; breadth 1·75 to 3·25 in.; petiole ·75 to 2·25 in. thickened at the base. *Spikes* axillary, suberect, 12 to 14 in. long, stout, striate, thickening to ·6 in. in diameter or more in fruit, the cicatrices of the fallen flowers very prominent, scurfy-puberulous. *Flowers* large, sessile. *Calyx* campanulate, 1·25 in. in diam. at the mouth, densely but minutely rusty-pubescent; the tube subcylindric, only ·2 in. long; the 4 lobes large, ovate-rotund, blunt, ·75 in. long. *Petals* 4, concave, rotund, scurfy outside. *Fruit* narrowly-oblong, 4-angled, sub-truncate at each end, the upper crowned by the calyx and the 2 inch long style, minutely pubescent, 4 or 5 in. long, and 1 to 1·5 in. thick.

PERAK: *King's Collector* 5746, 6154.

I have seen no expanded flowers of this as the collected specimens are either in bud or in fruit. Its nearest allies are *B. augusta*, Kurz, *B. pterocarpa*, Kurz, and *Doromma magnificum* Miers, but all these have much smaller flowers and their leaf petioles are very short. The ripe fruit of this resembles in shape a small *banana*, but the endocarp and pericarp have a very different texture, being in this densely fibrous.

9. Barringtonia fusiformis, King n. sp. A small tree, 10 to 20 feet high; young branches slender, puberulous, pale when dry. *Leaves* membranous, oblanceolate or obovate-oblong, narrowed to the cordate base, sessile or sub-sessile; the apex obtuse or acute; the edges remotely serrate becoming almost entire when old; main-nerves 12 to 16 pairs, curved, ascending, slightly prominent on the lower surface when dry; length 4 to 8 in.; breadth 1·4 to 2·4 in.; petiole (if present) only ·05 in. long. *Racemes* axillary, very slender, pendulous, much exceeding the leaves, lax, minutely rusty-pubescent, 1 to 2 feet long, surrounded at the base by a whorl of lanceolate persistent bracts ·5 in. long. *Flowers* ·4 in. across, distant, on slender pedicels 1 in. long; the bracteole at the base of each pedicel lanceolate, deciduous. *Calyx* 3 in. long; the tube obconic, densely rusty-puberulous; the teeth 4, broad, rounded, less puberulous than the tube. *Petals* slightly longer than the calyx, broadly obovate. *Stamens* three times as long as the petals. *Fruit* fusiform, tapering almost equally to each end; the apex crowned by the small calyx, 4-angled, deciduously rusty-pubescent, 2·25 in. long and only ·5 in. in diam.

Perak: *Scortechini; King's Collector* 10388, 10643, 10094.

The very long flower pedicels and the narrowly fusiform fruit distinguish this from all the other species.

10. Barringtonia acutangula, Gærtn. Fruct. II, 97, t. 101. A glabrous tree, 25 to 50 feet high; young branches thin, pale-grey, glabrous. *Leaves* obovate-oblong, or cuneate-elliptic, much narrowed to the shortly petiolate base, the apex broad rounded or subacute, the edges minutely denticulate or cuneate: main-nerves 10 to 13 pairs, spreading, not prominent; length 2 to 5 in.; breadth 1·1 to 2 in.; petiole ·15 to ·2 in. *Racemes* much exceeding the leaves, slender, pendulous, many-flowered, from 6 to 15 in. long. *Flowers* ·3 or ·4 in. across, in slender pedicels from ·05 to ·25 in. long. *Calyx* with short tube and 4 rounded, regular, ciliate teeth. *Petals* small, under ·25 in. long. *Filaments* about three times as long. *Fruit* oblong or oblong-ovoid, truncate at both ends, crowned by the small calyx, glabrous, boldly but bluntly quadrangular, 1·25 to 1·5 in. long. Roxb. Fl. Ind. II. 635; Blume Bijdr. 1097; W. & A. Prodr. 333; Miq. Fl. Ind. Bat. I, Pt. 1, 488; Dalz. & Gibs. Bomb. Fl. 95; Bedd. Fl. Sylv. t. 204; Brand. For. Fl. 235; Kurz For. Fl. Burm. I, 497; Clarke in Hook. fil. Fl. Br. Ind. II, 508; Trimen Flora Ceylon II, 191. *Stravidium rubrum*, DC. *l.c.* 289. *S. acutangulum*, Miers in Trans. Linn. Soc. Ser. II, Bot. I, 80 t. 17 figs. 1 to 14. *S. obtusangulum* and *S. Rheedii*, Blume in Van Houtte Flore des Serres VII, 24; Miers *l.c.* *Eugenia acutangula*, Linn. Sp. Pl. 673.

I include this species as Malayan with some hesitation. Most of the Malayan

specimens bearing the name I would refer to *B. spicata*, Bl. It is however a widely distributed and common tree in India and particularly so in Burma and it is quite likely to occur in Quedah and the northern part of Perak.

11. BARRINGTONIA SPICATA, Blume Bijdr. 1097. A tree, 30 or 40 feet high; young branches slender, smooth, brown when dry. *Leaves* oblong-oblanceolate, tapering to the short petiole, the apex acute or sub-acute, the edges distinctly serrate-dentate; main-nerves 8 to 10 pairs, curving slightly, ascending; length 4 to 8 in.; breadth 1·4 to 2·4 in.; petiole ·2 to ·3 in. *Spikes* axillary or terminal, exceeding the leaves, very slender, pendulous; bracteoles minute, caducous. *Flowers* small, numerous but not crowded, sessile or with a very short pedicel, about ·5 in. in diameter when expanded. *Calyx* with obconic, rusty-pubescent tube less than ·1 in. long, and 4 broad, rounded teeth half as long. *Stamens* ·5 in. long. *Fruit* sub-globose, glabrous, crowned by the enlarged calyx-lobes, about ·6 in. in diam. Miq. Fl. Ind. Bat. I, Pt. 1, 489; Vriese Ned. Kruidk. Arch. III, 41. *Stravidium spicatum*, DC. Prodr. III, 289; Blume in Van Houtte Flore des Serres VII, 24. *S. spicatum* and *globosum*, Miers in Trans. Linn. Soc. Ser. II, Bot. 1, 85. *Gustavia globosa*, Span. Trans. Linn. Soc. XV, 204. ? *Stravidium denussum*, *pubescens*, *reticulatum*, *Horsfieldii* and *serratum*, Miers *l.c.* 81 to 86. ?*S. coccineum*, DC. Prodr. III, 289; Miers *l.c.*

MALACCA: *Griffith* (K.D.) 2425; *Derry* 1221; *Maingay* (K.D.) 765. PENANG: *Curtis* 397. TRANG: *King's Collector* 1404. PERAK: *King's Collector* 4681. PROVINCE WELLESLEY: *Ridley* 7043. DISTRIB.—Java, Borneo; *Motley* 537, 582; *Zollinger* Cat. 534.

This resembles *B. acutangula*, Gærtn., but differs in having sessile flowers, shorter stamens, and sub-globose not elongated angular fruit. The leaves also are less obovate. It is a widely distributed species and therefore presents various forms, many of which have been treated as species.

11. PLANCHONIA, Blume.

Trees with alternate, membranous, crenulate, pinnately-nerved leaves without dots, crowded towards the ends of the branches. *Flowers* white or yellowish-green, in short terminal racemes. *Calyx-tube* turbinate, little produced beyond the ovary; its mouth with 4 imbricate lobes. *Petals* 4, imbricate. *Stamens* very numerous, in several series, slightly united at the base into a ring, the inner without anthers, the filaments of all long and slender. *Ovary* inferior, 3– 4-celled, crowned by an annular disc. *Style* 1, long, slender, crowned by the small stigma; ovules many in each cell. *Fruit* large, fibrous, ovoid, crowned by the persistent calyx-lobes, 1–3-celled. *Seeds* several, ellipsoid, the testa coriaceous, albumen absent, cotyledons short. DISTRIB.—Three species; littoral, from the Andaman islands to Australia.

Leaves obovate, distinctly crenulate; flowers sessile ... 1. *P. sundiaca.*
Leaves broadly elliptic, obscurely crenulate; flowers on long pedicels ... ... 2. *P. andamanica.*

1. PLANCHONIA SUNDIACA, Miq. A tree, 50 feet high; young branches thicker than a goose-quill, the bark rough, pale-brown. *Leaves* distinctly crenulate, obovate, much and gradually narrowed into the petiole; the apex with a short triangular apiculus; both surfaces brown (when dry), the reticulations faint: main-nerves 12 to 18 pairs, spreading, depressed on the upper prominent and often pale in colour on the lower surface; length 3 to 6·5 in.; breadth 1·75 to 3 in.; petiole ·3 to ·6 in. *Racemes* 2 in. long, few-flowered. *Flowers* white with pink towards the centre, about 1·5 in. long, sessile. *Calyx-tube* ·6 or ·7 in. long, campanulate, ribbed below: the lobes oblong, broad, subacute. *Petals* narrowly oblong, acute, longer than the calyx and about as long as the stamens. *Fruit* (unripe) broadly oblong-ovoid.

PERAK: *Wray* 2366; *King's Collector* 7096. DISTRIB.—Sumatra, *Forbes* 3254.

2. PLANCHONIA ANDAMANICA, King n. sp. A tree; young branches as thick as a goose-quill, pale-brown, smooth. *Leaves* broadly elliptic or elliptic-rotund, slightly and abruptly tapered into the narrowly winged petiole, the apex with a short triangular acumen, the edges indistinctly crenulate; upper surface olivaceous-brown, the lower pale-brown, not olivaceous; main-nerves 10 to 12 pairs, spreading, dark on the upper and pale on the lower surface but not very bold on either, length 5 to 7 in.; breadth 3 to 4 in.; petioles ·6 to ·8 in. *Racemes* 3 or 4 in. long; the flowers about 2 in. long on stalks 1 to 2 in. long. *Calyx* ·8 or ·9 in. long, campanulate, its lobes large, elliptic-rotund, obtuse. *Petals* broadly elliptic, very obtuse. *Fruit* unknown.

ANDAMAN ISLANDS: *King's Collector.*

From the Journal, Asiatic Society of Bengal, Vol. LXXI, Part II, No. 1, 1902.

III.—*Materials for a Flora of the Malayan Peninsula.*—*By* Sir George King, K.C.I.E., M.B., LL.D., F.R.S., &c., *late Superintendent of the Royal Botanic Garden, Calcutta.*

No. 13.

The present contribution carries these *Materials* to the end of the *Calycifloræ*. The orders included in it are *Datiscaceæ*, *Droseraceæ*, *Passifloraceæ*, *Begoniaceæ*, *Ficoideæ*, *Umbelliferæ*, and *Cornaceæ*. It has not been possible for me to prepare my account of the Calycifloral orders in the exact sequence followed in Hooker's Flora of British India; each order, however, bears the ordinal number given to it in that work. The species described in the present paper are 47 in number, and of these fourteen belonging to the genus *Begonia*, and two belonging to *Mastixia*, are new to science. I hope in future contributions to take up the orders belonging to the groups *Corollifloræ* and *Incompletæ*.

Order LXVII. DATISCACEÆ.

Trees or herbs. *Leaves* petioled, simple or pinnate; stipules 0. *Flowers* small, dicœcious in the Indian species, clustered, racemed or panicled. Male: calyx-tube short, teeth 3–9; petals 0; stamens 4–25. Female: calyx-tube adnate to the ovary, lobes 3–8 short; petals 0; ovary 1-celled, open or closed at the vertex; styles lateral, alternating with as many parietal placentæ, simple or 2-partite; ovules very many, ascending or horizontal. *Capsule* coriaceous or membranous, opening at the vertex between the styles. *Seeds* very many, small, albuminous; embryo straight, radicle next the hilum.—Distrib. Species 4; natives of the Mediterranean, Central Asia, Java, and North-West America.

Tetrameles, R. Br.

A large tree. *Leaves* petioled, ovate, pubescent beneath at least on the nerves. *Flowers* dicœcious, appearing before the leaves; males panicled, females in elongate racemes, clustered near the ends of the branchlets. Male: calyx-lobes short; teeth 4, ovate, one or two smaller teeth sometimes added; petals 0; stamens 4, opposite the calyx-teeth, inserted round a depressed disc; rudiment of the ovary 0 or quadrangular. Female: calyx-tube ovoid; teeth 4 short; petals 0; styles 4, short, stigmas simple somewhat club-shaped. *Capsule* ovoid, with 4 lines or slight ridges, membranous, opening at the top between the styles. *Seeds* very many, minute, flattened, ellipsoid, testa very lax and extending much beyond the nucleus as a loose membrane.

1. T. NUDIFLORA, R. Br. in Benn. Pl. Jav. Rar. 79, t. 17; A.DC. Prodr. XV. pt I. 411; Bedd. Fl. Sylv. t. 212; Brand. For. Fl. 245: Kurz For. Fl. 535; Clarke in Hook. f., Flor. Brit. Ind. II, 657. *T. Grahamiania*, Wight Ic. t. 1956; A.DC. l. c. *T. rufinervis*, Miq. Fl. Ind. Bat. I. pt. I. 726; A.DC. l.c. *Anictoclea Graham-iana*, Nimmo in Grah. Cat. Bomb. Pl. 252.—*Indeterminata*, Wall. Cat. 9045.

Andaman Islands; *Kurz.*—DISTRIB. Eastern Himālaya, Burma and Java.

Order LIV. DROSERACEÆ.

Herbs with large glandular hairs, exuding a viscid fluid. *Flowers* hermaphrodite, regular. *Petals* 5 hypogynous, rarely perigynous, thin, nerved, imbricate, marcescent, free or slightly united. *Stamens* 4 to 20, hypogynous or slightly perigynous; filaments free or slightly monadelphous, subulate or filiform: anthers 2-celled; disc none. *Ovary* free or adherent by its base to the calyx, globose or ovoid, 1-celled; *styles* 5, sometimes 3, simple or bifid; *stigmas* capitate; placentas parietal, equal in number to the styles; *ovules* and *seeds* numerous. *Capsule* membranous, 1-to 5-celled. *Seeds* with fleshy albumen; *embryo* cylindric or minute.—DISTRIB. Species about 100; in temperate and tropical regions generally, but absent from the Pacific Islands.

DROSERA, Linn.

Small perennial herbs. *Leaves* radical and rosulate, or cauline and alternate, bearing many large glandular viscid hairs, usually circinate in vernation, with scarious stipules adnate to the petiole, or exstipulate. *Calyx* persistent, free from the ovary, 4-to 8-partite or sepals free. *Petals* 4 to 8, hypogynous or very slightly perigynous, marcescent. *Stamens* equal in number to the petals, hypogynous or slightly perigynous. *Ovary* 1-celled; *styles* 2 to 5; *ovules* parietal, numerous. *Capsule* loculicidally 2-to 5-valved. *Seeds* numerous, obovoid-ellipsoid (in the Indian species); testa black, smooth, reticulate.—DISTRIB. Species about 90, cosmopolitan, but absent in Polynesia; Australia.

Leaves cuneate-spathulate, all radical	1 *D. Burmanni.*
Leaves peltate-lunate with long narrow petioles, some radical the others cauline	2 *D. peltata.*
Leaves linear, all cauline	3 *D. indica.*

1. DROSERA BURMANNI, Vahl Symb. III, 50. *Leaves* all radical, rosulate, cuneate-spathulate, ·5 to 1·5 in. long, stipules half as long as the petiole. Peduncles erect, 3 to 8 inches high, naked, glabrous. *Flowers* racemose, their pedicels glabrous, erect in fruit; calyx minutely papillose: styles 5, simple. Don, Prod. Fl. Nep. 212; DC. Prod. I, 318; Roxb. Fl. Ind., II, 113; Wall. Cat. 1242; Wight, Ill. t. 20; Wight, Ic.

944; W. & A. Prod. Fl. Penins. Ind. 34; Planch. in Ann. Sc. Nat. Ser. III. Vol. IX, 190; Miq. Fl. Ind. Bat., Vol. 1, pt. II, 120; Suppl. 160; Hf. & Th. in Journ. Linn. Soc. II., 82; Dalz. & Gibs. Fl. Bomb., 12; Kurz in Journ., As. Soc., Beng., 1876, pt. II, 310; Clarke in Hook. fil. Fl. Br. Ind. II, 424; Trimen, Fl. Ceyl. pt. II, 145.

Malacca: Province Wellesley, and probably in the other provinces.—Distrib. British India, Ceylon, the Malay Archipelago, China, Japan Africa, Australia, up to elevations of 8,000 feet.

2. Drosera peltata, Sm. ex Willd. Sp. Pl. I, 1546. *Stem* erect, leafy, 3 to 12 in. high, simple or branched near the apex. *Leaves* sub-rosulate, also scattered and alternate on the stem, peltate-lunate, with very long glandular hairs, ·2 to ·25 in. broad (including the radiating hairs); the petiole much longer than the laminæ, very slender. *Racemes* 1 to 3 in. long, terminal or sub-terminal; flower-pedicels ·35 to ·75 in. long, glabrous. *Sepals* ovate, glabrous, erose or fimbrirate. *Styles* 3, fimbriate. *Seeds* as in *D. indica*, III. DC. Prod. I, 319; Sm. Exot. Bot., I, 41; Don Prod. Fl. Nep., 212; Wight. t., 20; W. & A. Prod. Fl. Penins. Ind., I, 34; Planch. in Ann. Sc. Nat. Ser. III, Vol. IX, 296; Kurz in Journ. As. Soc. Beng., 1876, pt. 2, 310; Clarke in Hook. fil. Fl. Br. Ind., II, 424; Trimen, Fl. Ceyl. pt. II, 146. *D. lunata*, Ham.: DC. Prod. 1, 319; Wall. Cat., 1243; Hook. Ic. Pl. 54; Planchon l.c., 296; Miq. Fl. Ind. Bat., II, Pt. 2, 120. *D. lunata, gracilis* et *D. foliosa*, Hook. fil. Journ. Linn. Soc., II, 82; 297, 298. *D. Lobbiana* Turcz. (fide Kurz).

Malacca, Singapore, and probably in some of the other provinces.—Distrib. Malay Archipelago, British India, and Australia.

3. Drosera indica, Linn. Sp. Pl. 282. *Stem* 2 to 12 in. long, decumbent, usually simple. *Leaves* alternate, scattered, 1 to 3 in. long, linear, not much broader than the glabrous petiole, very glandular-pubescent. *Racemes* 2 to 6 in. long, leaf-opposed; flower-pedicels ·35 to ·75 in. long, rusty-pubescent. *Sepals* lanceolate, minutely glandulose or sub-glabrous. *Styles* 3, bifid to the base. *Seeds* obovoid, much reticulate not scrobiculate. DC. Prod., I, 319; Roxb. Fl. Ind., II, 113; Wall. Cat., 1244; Wight Ill. t., 20; W. & A. Prod. Fl. Penins. Ind., 34: Planch. in Ann. Sc. Nat. Ser., III, Vol. IX, 209; Miq. Fl. Ind. Bat., Vol. I, Pt. 2, 120; Hf. & Th. in Journ. Linn. Soc. II, 82; Dalz. & Gibs. Fl. Bomb., 12; Kurz in Journ. As. Soc Beng., 1876, Pt. II, 310; Trimen Fl. Ceyl., Pt. II, 146; Clarke in Hook. fil. Fl. Br. Ind., II, 424. *D. Finlaysoniana*, Wall. Cat., 3752. *D. serpens*, Planch. l.c., 204.—Rheede, Hort. Malab., X, t. 20.

Malacca: Province Wellesley, and probably in the other provinces.—Distrib. British India, Ceylon, Malayan Archipelago, tropical Australia, and Africa.

Order LI. PASSIFLOREÆ.

Twining herbs or shrubs, rarely erect. *Leaves* alternate, stipulate, entire or lobed, penni- or palmi-nerved, frequently glandular beneath. *Petiole* usually bearing glands. *Stipules* foliaceous or minute. *Tendrils* axillary or 0. *Inflorescence* axillary, cymose, sometimes with one or more branches cirrhose, rarely flowers solitary. *Bracteoles* 3, minute and scattered, or foliaceous and forming an epicalyx, rarely 0. *Flowers* regular, unisexual, or bisexual. *Calyx* tubular at the base, fleshy, subcoriaceous or membranous; segments imbricate, 5. *Petals* 0 or as many as the calyx-lobes, springing from the tube of the calyx, membranous or fleshy, imbricate, marcescent. *Corona* of one or more rows, filamentous or membranous or both, arising from various portions of the calyx-tube, rarely 0; basilar corona urceolate or cup-shaped, surrounding the base of the androecium, sometimes represented by five separate glands of the disc; rarely 0. *Stamens* 5, in a tube or free to the base, perigynous; anthers oblong, 2-celled, basi- or dorsi-fixed, dehiscing laterally or introsely. *Ovary* superior, on a gynophore or subsessile, 1-celled with 3 parietal placentas, rudimentary or absent in the male flowers. *Styles* 1 or 3; stigmas reniform, capitate or flattened. *Ovules* numerous, pendulous, anatropus; funicle expanded into a cup-shaped arillus. *Fruit* baccate or capsular. *Seeds* numerous, ovoid or flattened, often pitted, covered with a fleshy arillus; albumen fleshy, rarely scanty; embryo straight, cotyledons flat leafy, radicle short terete.—DISTRIB.: Chiefly tropical; most numerous in South America. Genera about 18; species about 320.

Erect shrubs, without tendrils	1 PAROPSIA.
Scandent, with tendrils:—	
Fruit pulpy, indehiscent; flowers large	2 PASSIFLORA.
Fruit dehiscent; flowers small	3 ADENIA.

1. PAROPSIA, Noronh.

Shrubs. *Leaves* simple. *Flowers* in dense axillary cymes. *Calyx-tube* short; limb 5-parted. *Petals* 5, springing from the base of the calyx-tube. *Corona* of fine threads springing from the tube of the calyx and more or less divided into five phalanges. *Gynophore* short; filaments flat; anthers oblong. *Ovary* subglobose. *Style* short, dividing into three branches; stigmas reniform-capitate. *Fruit* capsular.—DISTRIB. Species 4 or 5, natives of tropical Africa and Malaya.

P. VARECIFORMIS, Mast. in Trans. Linn. Soc., XXVII, 639. A shrub or small tree. *Leaves* subcoriaceous, oblong or oblong-lanceolate, acute or shortly acuminate, the base cuneate, the edges entire or (rarely) minutely serrate; both surfaces glabrous except the glandular puberulous

midrib and nerves; the lower with numerous minute adpressed scales; main 6 or 7 pairs spreading, curved; length 2·5 to 5·25 in., breadth 1 to 1·75 in., petiole ·1 to ·2in. *Flowers* about ·5 in. in diam., on short, rusty-tomentose pedicels ·15 in. long. *Calyx* campanulate, leathery, adpressed-villose outside like the pedicels, the lobes much longer than the tube, unequal, oblong, subacute. *Petals* oblanceolate, smaller than the calyx-lobes. *Corona* single, very short, lanate, in 5 phalanges. *Stamens* 5. *Gynophore* shorter than the corona; ovary villose. *Fruit* ovoid or sub-globose, ·5 to ·7 in. across. Masters in Fl. Br. Ind., II, 600. *P. malayana*, Planch. ex Masters l.c. *Trichodia vareciformis*, Griff. Notul., IV, 571.

Malacca: Griffith, Manigay, and others. Perak: Scortechini, King's Collector; a common plant.

I can find no constant characters to separate the two species into which this plant has been divided in the Flora of British India and therefore unite them under the oldest specific name.

2. Passiflora, Linn.

Twining shrubs. *Leaves* simple or palmilobed, usually with glands on the under surface and on the petiole; stipules thread-like or leafy. *Flowers* pedunculate; often involucrate; peduncles simple or cymose. *Bracteoles* 3, small, scattered. *Calyx-tube* fleshy, limb 5-lobed. *Petals* 5, springing from the throat of the calyx. *Corona* of one or more rows of fine threads springing from the throat of the calyx-tube and of one or more membranous folds arising lower down. *Gynophore* surrounded at the base by a shallow membranous cup or basilar corona; filaments 5, flat; anthers oblong, 2-celled, dorsifixed; pollen-grains reticulate on the surface. *Ovary* 1-celled; styles 3, stigmas reniform-capitate. *Fruit* baccate. *Seeds* arillate.—Distrib. A genus of about 250 species which are most numerous in tropical and sub-tropical America.

Passiflora Horsfieldi, Blume, Rumphia, I, 170, t. 52. A slender climber; young branches slightly quadrangular, slender, striate, almost glabrous. *Leaves* membranous, oval or oblong-ovate, subacute sometimes retuse, the base rounded and minutely emarginate; upper surface pale-brown when dry, shining, glabrous, minutely reticulate; lower surface when young sometimes with sparse deciduous hairs, but more usually glabrous from the first, always dull and whitish and with a few flat dark-coloured glands, the transverse veins and reticulations very distinct; main-nerves about 5 pairs, ascending, faint; length 4 to 6 in.; breadth 2·5 to 3·25 in.; petiole ·6 to ·9 in., with two oval flat glands near its middle. *Inflorescence* shorter than the leaves, axillary, about 5-flowered, the flowers 1·25 to 1·5 in. in diam., on slender long pedicels, white tinged with green; corona double, the outer with long erect

filamentous segments; the inner about one-fourth as long, its segments few, lanceolate, incurved. *Stamens* 5; the filaments spreading, clavate; anthers dorsifixed, oblong. *Ovary* ovoid, hirsute, the gynophore nearly as long as the outer corona; styles long, recurved. *Fruit* subglobular, ·75 in. in diam. *Disemma Horsfieldii*, Miq., Fl. Ind. Bat., I, Pt. 1, 700.

Perak; *Scortechini* 655, 2,192; *King's Collector* 3,078, 4,104, 5,936, Distrib.—Java and Madura.

This is apparently the only species really indigenous in the Malayan Peninsula. There are, however, four American species which have escaped from cultivation. These are:—

P. suberosa, L. A small species with diversely shaped leaves, flowers little more than half-an-inch in diameter and ovoid fruits about the same in length.

P. foetida, L. A species with variable leaves, emarginate at the base, often 3-lobed; recognisable at once by its foetid flowers and 3-leaved fimbriate involucre.

P. edulis, Sims. With deeply 3-lobed serrate leaves, flowers more than an inch across; and globular edible fruit. This is often cultivated under the name of *Granadilla*.

P. quadrangularis, L. A large species with boldly 4-angled stems; handsome fragrant, purple flowers banded with white, 3 to 5 in. across; broadly ovate leaves and large oblique ovate-oblong stipules.

P. laurifolia, L. A more slender species than the last and with smaller flowers of similar colour, with a large 3-leaved or 3-partite involucre of broad segments, and of long filiform stipules; the leaves broadly oblong, entire and shortly apiculate.

3. Adenia, Forsk.

Scandent. *Leaves* entire or palmilobed, usually with two or more flat circular glands on the under surface and with similar glands at the apex of the petiole. *Cymes* axillary, few or many-flowered, on long peduncles, one or more of which is sterile and tendril-like. Male flower: *Calyx* tubular or bell-shaped; limb 5-lobed, lobes leathery, imbricate. *Petals* 5, free, membranous, 1-nerved, springing from the calyx-tube. *Corona* a ring of threads arising from near the base of the calyx-tube, or wanting. *Glands of the disc* 5, opposite the sepals, strap-shaped or capitate. *Andrœcium* cup-shaped, membranous beneath; filaments 5, linear-subulate; anthers linear-oblong, 2-celled. *Ovary* rudimentary or 0. Female flower: *Calyx* and *corolla* as in the male. *Corona* a membranous fold, springing from near the base of the calyx-tube, or none. *Glands of the disc* 5, strap-shaped, capitate, opposite the sepals. *Staminodes* 5, forming a membranous cup surrounding the base of the ovary, above dividing into barren filaments. *Ovary* globose or elliptic, sessile or stalked; style cylindrical or none; stigmas 3, capitate or flat and dilated. *Fruit* capsular, 3-valved. *Seeds* numerous, attached by long funicles to parietal placentas.—Distrib. About 40 species, natives of the tropics of the Old World.

NOTE.—The name used for this genus in Hooker's Flora of British India is *Modecca*, Lamk. which dates from 1797. Following Engler, I have here used Förskal's name *Adenia*, which dates from 1775.

Leaves always deeply 3-lobed ... ... 1 *A. trilobata.*
Leaves entire:—
Leaves minutely peltate at the base; lobes of calyx long, narrow and reflexed ... ... 2 *A. nicobarica.*
Leaves cordate at the base:—
Base broadly and deeply cordate, main-nerves radiating from the base: flowering peduncles up to 6 in. long ... ... 3 *A. cardiophylla.*
Base slightly cordate: main-nerves pinnate: flowering peduncles less than 2 in. long ... 4 *A. populifolia* var. *pentamera.*
Leaves not cordate at the base or only occasionally very slightly so: main-nerves usually 2 sometimes 3 pairs:—
Nerves and reticulations of leaves distinct ... 5 *A. acuminata.*
Nerves and reticulations of leaves invisible, the lower surface of the leaves whitish ... ... 6 *A. singaporeana.*

1. ADENIA TRILOBATA, Engl. Jahrb., XIV, 375. Many feet in length, glabrous, the bark on the old shoots cinereous, on the young smooth green. *Leaves* remote, membranous, broadly cordate at the base, deeply 3-lobed; the lobes lanceolate, the two outer often auriculate at the base, the sinuses wide, rounded, and each bearing a small gland; main-nerves 5, palmate; the lateral nerves and the reticulations few; length 6 to 9 in.; width 4·5 to 6·5 in.; *petioles* from half as long to nearly as long as the leaf-blades, terete, smooth, not enlarged at the base, the apex with two conical recurved glands. *Peduncles* slender, smooth, terete, axillary, longer than the petioles, umbellulately cymose; flowers few, ·3 to ·5 in. long, the females somewhat longer than the males. *Calyx* tubular, the lobes short, oblong, subacute. *Petals* narrowly oblong, inserted near the base of the calyx-tube. *Filaments* united into a tube springing from the fundus of the calyx; *anthers* linear-oblong, abruptly acute, the connective produced into a minute point. *Glands* narrowly oblong, blunt, incurved. *Staminodes* in female flower united into a membranous cup. *Rudimentary* ovary in male flower trifid. *Fruit* oblong, scarlet, from 2 to 2·5 in. long when ripe, and 1·5 in. in diam. *Seeds* compressed, sub-obcordate or sub-rotund, scrobiculate, the arillus thin, clear. *Modecca trilobata*, Roxb. Hort. Beng., 49; Roxb. Corom. Plant. III, t. 297; Fl. Ind., III, 133; Wall. Cat., 1234; Kurz, in Journ. As. Soc., Beng., 1877, II, 95; Masters in Hook. fil. Fl. Br. Ind., II, 602.

ANDAMAN ISLANDS; common.—DISTRIB. Northern parts of British India and Burma.

2. ADENIA NICOBARICA, King. Slender and slightly branched, glabrous *Stems* minutely sulcate, thin, wiry. *Leaves* membranous,

entire, narrowly elliptic-oblong or lanceolate; the base rounded and minutely bi-glandular, slightly peltate; the apex acuminate, rarely abruptly acute; both surfaces shining; main-nerves only about 4 pairs, interarching broadly and far from the edge; intermediate nerves horizontal; reticulations wide; length 2·5 to 4·5 in.; width ·6 to 1·8 in.; petiole ·4 to ·8 in., compressed, not enlarged at the base. *Peduncles* longer than the petioles but much shorter than the leaves, bearing a filiform tendril and only one or two flowers. *Flowers* rather less than ·5 in. long, green. FEMALE FLOWER unknown. MALE FLOWER ·4 to ·5 in. long *Calyx* campanulate, deeply divided into 5 linear-oblong, subacute, much reflexed lobes. *Petals* shorter than the calyx and inserted into it below the middle, membranous, reticulate, oblanceolate, their apices truncate and broad. *Glands* short, oblong, truncate. *Anthers* about equal to the petals, oblong, obtuse, cordate at the base; the filaments united into a wide tube. *Fruit* elliptic-oblong, tapered to each end, from 1·5 to 2·3 in. long, and ·75 in. in diam., reddish when dry, smooth. *Seeds* much compressed, sub-orbicular, with a few shallow pits in the centre, and a row of short depressed radiating grooves round the edge, the aril very thin. *Modecca nicobarica*, Kurz in Trimen's Journ. Bot. for 1875, p. 327; Mast. in Hook. fil. Fl. Br. Ind. II, 603.

ANDAMAN and NICOBAR ISLANDS; not uncommon. MALACCA; *Maingay* (Kew Distrib.) 670. PERAK; *Wray* 651, 2781; *King's Collector* 2439; *Scortechini* 633; *Ridley* 10280. PENANG; *Curtis* 1521.

A species distinguished by its entire oblong leaves minutely peltate at the base, by its long narrow reflexed calyx-lobes, and by its rotund seeds with *shallow* pits in the centre and radiating grooves at the edges.

3. ADENIA CARDIOPHYLLA, Engl. in Jahrb. XIV, 376. Rather stout, glabrous. *Stems* almost terete. *Leaves* membranous, remote, broadly ovate, rotund-ovate, sometimes almost sub-reniform, the base deeply cordate, the auricles rounded; the apex with a short triangular point; both surfaces smooth; the lower with numerous distinct reticulations; main-nerves about 9, radiating from the base; the secondary nerves sub-horizontal, numerous; length 5 to 9 in.; breadth 3·5 to 7·5 in.; petiole 2 to 4·5 in. long, not thickened at the base but with 2 sessile glands at the apex. *Peduncles* 4 to 6 in. long, longer than the petioles, with several widely-spreading cymose branches and usually one tendril. MALE FLOWER narrowly ovoid, ·2 in. long. *Calyx* leathery, spotted inside, the mouth with blunt short teeth. *Petals* thin, broadly oblong-lanceolate, subacute, spotted, their apices level with those of the teeth of the calyx, their bases inserted about the middle of the calyx-tube. *Glands* short, oblong-cuneiform. *Anthers* linear-ovate, acute, the filaments united into a tube inserted into the fundus of the calyx. FEMALE FLOWER twice as

long as the male, tubular. *Calyx* as in the male, the teeth recurved. *Petals* as in the male, their apices entire or minutely serrulate. *Ovary* ovoid, on a short gynophore, the stigma peltate 3-lobed. *Fruit* broadly fusiform, 2 to 2·5 in. long and 1 in. in diam. at the middle, dirty-yellowish when dry. *Seeds* compressed, sub-rotund, keeled, with prominent sharply edged deep pits in the centre and a row of elongate pits round the edges. *Modecca cardiophylla*, Mast. in Hook. fil. Fl. Br. Ind. II, 602. *Modecca cordifolia*, Kurz (not of Blume) in Journ. As. Soc. Beng., 1876, II, 132: Masters in Hook. fil. Fl. Br. Ind. II, 602. *M. heterophylla*, Kurz, (not of Blume) Andam. Report Append. A., 39.

Andaman Islands; very common. Nicobar and Great Coco Islands; *Prain.*—Distrib. Cambodia, Khasia Hills and Eastern Bengal, tropical Eastern Himalaya.

A species well marked by its deeply cordate leaves much reticulate on the lower surface, widely-spreading cymes and sub-rotund cancellate pitted seeds. Some confusion in nomenclature has arisen from the fact that Kurz, without having seen authentic specimens of Blume's two species *Modecca cordifolia* and *M. heterophylla* referred this plant to both of them. Dr. Masters perpetuated part of Kurz's mistake by accepting his view as to the identity of this Andaman and Nicobar plant with *M. cordifolia*, Blume, whereas the whole of the Andaman material (greatly increased in bulk since he wrote) really belongs to his own species *M. cardiophylla*. This view was first expressed by Dr. D. Prain, Superintendent of the Calcutta Garden in a note on one of the specimens in the Herbarium there.

4. Adenia populifolia, Engl. in Jahrb. XIV, 376, var. pentamera King. A slender and often very extensive climber (often 150 feet) *Stems* slender, smooth, terete. *Leaves* thinly coriaceous, oblong-ovate, gradually narrowed to the acute or sub-acute apex, the base slightly cordate; both surfaces smooth, the nerves and reticulations little prominent when dry: main-nerves 5 to 7 pairs, curved, spreading, rather faint; length 3 to 5 in.; breadth 1·75 to 2·5 in.; petiole ·75 to 1·25 in., its apex bearing 2 large cup-shaped glands conjoined by their backs. *Peduncles* shorter than the leaves with 2 slender spreading branches and a single rather stout tendril. *Flowers* not numerous, on slender unequal pedicels, some of them ·75 in. long. Male flower ·2 in. long, narrowly fusiform; the calyx with 5 short oblong blunt lobes. *Petals* springing from the calyx-tube just below its lobes, and like them but narrower. *Anthers* 5, broadly linear, the connective slightly produced beyond the apex, shortly sagittate at the base; filaments joined into a tube and inserted into the fundus of the calyx: rudimentay ovary linear. Female flower shorter than the male (only ·15 in. long) and not so slender but with similar calyx-lobes and petals. *Ovary* oblong, crowned by three erect oblong rather large stigmas. *Fruit* double fusiform, deep red when ripe, 2·5 to 3 in. long and from ·75 to 1 in. in

diam. *Seeds* broadly oblong, compressed, foveolate with a row of short radiating grooves round the edges. *Modecca populifolia*, Blume Rumphia, 168 t. 50. *M. populifolia*, Bl.: Masters in Hook. fil. Fl. Br. Ind. II, 603 (*amongst imperfectly known species*).

MALACCA; *Maingay* (K.D.) 668. PERAK; *Scortechini* 1609; *King's Collector*, many Nos.

Blume describes and figures his *Modecca populifolia* plant as tetramerous and as this exactly agrees both with his text and figure, except in being pentamerous, I regard it as a variety. There are in Herb. Calcutta specimens from Perak without flower or fruit, of what appears to be a 3-lobed form of this.

5. ADENIA ACUMINATA, King. *Stems* slender, striate. *Leaves* subcoriaceous, ovate-oblong or rotund-ovate, the base usually narrowed but sometimes sub-cordate always bi-glandular; the apex shortly and abruptly acuminate; the secondary nerves and reticulations distinct on both surfaces when dry but especially on the lower; main-nerves 2 or sometimes 3 pairs, originating from the midrib near its base, all prominent: length 4 to 6 in.; breadth 2 to 4 in.; petiole ·75 to 1·35 in. long. *Peduncles* usually nearly as long as the leaves but sometimes much shorter, bearing a few short many-flowered spreading branches at the apex and often a short tendril. MALE FLOWER narrowly ovoid, ·25 to ·3 in. long. *Calyx* leathery with 5 short ovate-lanceolate lobes. *Petals* thick, oblong, acute, springing from the calyx-tube above the middle. *Glands* small, lanceolate. *Anthers* linear, sub-acute, erect, the filaments short. FEMALE FLOWER larger than the males (·4 in. long), tubular, swollen in the lower third. *Calyx-lobes* very short, broad, blunt, incurved. *Petals* narrowly oblong, sub-acute, incurved. *Ovary* fusiform. *Fruit* fusiform, dull, reddish when dry, about 2 in. long and ·75 in. in diam. at the middle. *Seeds* compressed, subrotund, boldly pitted in the centre and with a marginal row of radiating grooves on each side, slightly oblique and pointed at the base. *Modecca acuminata*, Blume Bijdr. 940; Miq. Fl. Ind. Bat. I, Pt. 1,702. *M. singaporeana*, Mast. in Hook. fil. Fl. Br. Ind. II, 601 (*in part*).

PERAK; *Scortechini* 254, 459, 629; *Wray* 498, 1745; *Ridley* 9462, 9632; *King's Collector*, many numbers. SELANGOR; *Ridley* 7288. MALACCA; *Goodrich* 1340.—DISTRIB.; Java, Sumatra, (*Beccari* P.S. 743).

6. ADENIA SINGAPOREANA, Engl. in Jahrb. XIV, 376. *Stems* slender, striate. *Leaves* subcoriaceous, oblong to ovate-oblong, cuneate and biglandular at the base, the apex sub-acute or shortly and bluntly acuminate; both surfaces smooth, opaque, the lower very pale, the secondary nerves and reticulations very indistinct on both; main-nerves 3 pairs, the lower two pairs bold and ascending, the upper pair less bold and spreading; length 3·5 to 4·5 in.; breadth 1·75 to 2·25 in.; petiole

·5 to 1·5 in. long. *Peduncles* about as long as the petiole, few-flowered. *Male flowers* (*fide* Masters) "·25 in. long, elongate, fusiform. *Calyx* leathery, shortly 5-lobed; lobes ovate, connivent (? always). *Petals* thick, leathery, oblong-acute, springing from the calyx-tube just beneath the throat. *Corona* none (?). *Glands* of the disc 5, small, oblong, at the base of the calyx-tube, opposite to its lobes. *Stamens* 5; anthers sub-sessile, erect, linear; connective long, thread-like. *Rudimentary ovary* fusiform. *Fruit* 2 in. long, glabrous, fusiform." *Seeds* compressed, sub-ovoid, obliquely contracted to a short podosperm, the centre boldly tubercled, the edges with a row of broad grooves the tubercles between which on the extreme margin are bold and some of them black. *Passiflora singaporeana*, Wall. Cat. 1232. *Modecca singaporeana*, Masters in Hook. fil. Fl. Br. Ind. II, 601.

SINGAPORE; *Wallich*. JOHORE; *King*. MALACCA; *Maingay* (K.D.) 667.—DISTRIB. Java.

A species badly represented in collections and misunderstood. It is based on the plant collected by Wallich at Singapore and issued by him under his Cat. No. 1232 and named *Passiflora singaporeana*. With this agree absolutely a plant collected by Mr. Hullett and myself at Jaffaria (in Johore) also some specimens collected by Mr. H. O. Forbes in the Preanger in Java (*Herb. Forbes* 565). Maingay collected at Malacca six specimens of a *Modecca* all of which in Herb. Kew. are named *M. singaporeana*. In my opinion five of these belong to *M. acuminata*, Bl. I have seen no flowers of *M. singaporeana* and the account of them given above is copied verbatim from Masters. The leaves are very opaque and of a dull pale colour beneath, and the nerves are very faint. The fruit is slightly shorter than that of *M. acuminata*, Bl. of which species this is I fear little more than a form.

Order LII. BEGONIACEIÆ.

Succulent herbs or undershrubs; stem often rhizomatous or tuberous. *Leaves* alternate (sometimes falsely whorled), more or less unequal-sided, entire, toothed or lobed; stipules 2, free, frequently deciduous. *Peduncles* axillary, dichotomously cymose, the branches and bracts at their divisions generally opposite. *Flowers* white rose or yellow, showy, sometimes small, monœcious. MALE: perianth (of the only Indian genus) of 2 outer valvate opposite sepaloid segments, and 2-0 inner smaller segments; stamens indefinite often very many, free or monadelphous, anthers narrowly obovoid. FEMALE: perianth (of the only Indian genus) of 5-2 segments. *Ovary* inferior (in *Hildebrandia* half-superior), 2-3-4-celled; placentas vertical, axile (at the time of æstivation), divided or simple; styles 2-4, free or combined at the base, stigmas branched or tortuous; ovules very many. *Fruit* capsular, more rarely succulent, often winged, variously dehiscing or irregularly breaking up. *Seeds* very many, minute, globose or narrow-cylindric, testa

reticulated: albumen very scanty or 0.—DISTRIB. Species 400 (of which 398 belong to the genus *Begonia*), in all tropical moist countries; not yet met with in Australia.

1. BEGONIA, Linn.

Characters of the Order.

GROUP I. Capsule 3-celled, with 3 nearly equal narrow vertically oblong wings, dehiscing by 2 oblong valves on each face between the wings:—

Small acaulescent herbs, only a few inches in height: leaves rotund-ovate slightly oblique ... ... 1. *B. Forbesii.*

Herbs with stems 2 or 3 feet high; leaves obliquely ovate-oblong or ovate-lanceolate, the base cordate and very unequal-sided:—

Male flowers ·2 to ·3 in. across ... ... 2. *B. isoptera.*

Male flowers 1·5 in. across ... ... 3. *B. isopteroidea.*

GROUP II. Capsule 2-celled, triquetrous, with 3 short unequal wings, dehiscing irregularly by the breaking up of the fragile faces between the wings; anthers obovoid, often emarginate at the apex:—

Caulescent; rootstock tuberous:—

Upper surfaces of leaves with numerous adpressed white stellate hairs; bracts of inflorescence ·05 to ·1 in. long, densely adpressed-pubescent; male flowers ·2 to ·25 in. in diam.; capsules about 3 in. broad ... 4. *B. sinuata.*

Upper surfaces of leaves scantily adpressed hairy; bracts ·35 to ·5 in. long, glabrous; male flowers ·5 in. and capsules ·6 in. across ... ... 5. *B. andamensis.*

Leaves glabrous ... ... 6. *B. debilis.*

Acaulescent; rhizome creeping:—

Leaves rather thick (when dry), rotund-reniform, deeply cordate the basal lobes overlapping, the nerves beneath and the petioles rusty-tomentose ... 7. *B. thaipingensis.*

Leaves very thin (when dry), obliquely ovate-reniform, quite glabrous except for a few sparse hairs on the under surface of the nerves; petioles glabrous ... 8. *B. guttata.*

GROUP III. Capsule 2-celled, triquetrous with 3 wings one of which is much elongated transversely so as greatly to exceed the other two, dehiscing by the rupture of the stout membranous faces between the wings:—

Anthers cuneiform-oblong; leaves peltate ... ... 9. *B. Hasskarlii.*

Anthers linear-oblong or linear; leaves not peltate:—

Leaves not at all or very little oblique even at the base, not cordate; petioles very long:—

Leaves with coarse hairs on both surfaces:—

Leaves narrowly lanceolate ... ... 10. *B. Scortechinii.*

Leaves ovate-lanceolate ... ... 11. *B. Kunstleriana.*

Leaves glabrous :—	
Leaves broadly elliptic-ovate, equal-sided at the base	12. *B. Herveyana.*
Leaves ovate-lanceolate, unequal-sided especially at the base	13. *B. perakensis.*
Leaves very oblique, ovate to reniform, obliquely cordate at the base :—	
Leaves glabrous even on the nerves :—	
Male flowers less than 1 in. across	14. *B. paupercula.*
Male flowers about 1·5 in. across	15. *B. venusta.*
Leaves glabrous, but the nerves hairy; male flower 2 in. across	16. *B. megapteroidea.*
Leaves with a few coarse compressed rusty-pubescent hairs on both surfaces; nerves beneath, petioles and also peduncles rusty-pubescent; male flowers ·8 in. across	17. *B. Maxwelliana.*
Upper surfaces of leaves papillose and bearing coarse hairs :—	
Acaulescent; petiole much longer than the lamina	18. *B. praeclara.*
Stems 3 feet high; petiole shorter than the blade	19. *B. Lowiana.*

1. Begonia Forbesii, King n. sp. A small plant a few inches high with densely rusty-villose rhizome. *Leaves* rotund-ovate shortly apiculate, sometimes blunt, the base slightly cordate, the edges subentire or remotely denticulate; upper surface glabrous: the lower with numerous white scales and a few coarse hairs on the nerves near their bases: main-nerves 9, radiating from the base, inconspicuous; length 1·25 to 2·25 in.; breadth 1 to 2 in.; petiole 1·5 to 3 in.; stipules lanceolate, villous externally, ·3 in. long. *Peduncles* as long as or longer than the leaves, slender, glabrous, bearing a solitary flower at the apex, or 2-branched and bearing 2 to 5 flowers; bracts absent on the lower part of the peduncle, in pairs in its upper part, small, obovate-oblong. *Flowers* pink, their pedicels red. Male; *sepals* 2, oblong, blunt, ·15 in. long; *petals* 2, similar but smaller; *stamens* numerous; *anthers* obovate, with emarginate apices, filaments short. Females; *perianth* of 4 unequal pieces, the outermost rotund-ovate: the inner oblong. *Styles* 3, thick, the stigmas large, flattened, rotund. *Capsule* 3-celled, opening on each face; the wings subequal, spreading, triangular, blunt.

Perak; *Wray* 2476.—Distrib. Sumatra, *Forbes* 2666.

2. Begonia isoptera, Dry. in Smith's Ic. 43. Caulescent: three feet high, nearly glabrous; stem and branches slender. *Leaves* obliquely ovate-oblong or ovate-lanceolate, shortly acuminate, the base cordate, the sides very unequal; edges remotely and usually coarsely dentate; upper surface of leaves quite glabrous, the lower minutely scaly; main-nerves mostly radiating from the base, branched, prominent; length 3·5 to 6 in.; breadth 1·5 to 3 in.; petioles slender, varying from ·5 to

2·25 in. in length: *stipules* lanceolate or oblong, ·75 in. long. *Inflorescence* leaf-opposed, shorter than the leaves, slender; the female flowers near its base, the male on short branches on its upper half. MALES ·2 to ·3 in. across; *sepals* 2, rotund; petals 0; *stamens* numerous, broadly oblong or obovate, minutely apiculate; filaments short. FEMALE *perianth*-segments 5. *Styles* three, bifid, the arms twisted. *Capsule* 3-celled, about ·8 in. long and equally broad, dehiscing by two slits on each face, the three wings equal, narrow, oblong, ·25 in. wide. Dry. in Trans. Linn. Soc. I, 160. *B. repanda*, Bl. Enum. Pl. Jav. I, 97. *Diploclinium repandum*, Klo. Begon. 72. *Begonia Wrayi*, Hems. in Journ. Bot. for 1887, 203.

PERAK; *Scortechini* and *King's Collector*, many numbers. MALACCA; *Hervey*. SELANGOR; *Ridley* 8589. PAHANG; *Ridley* 2246. NEGRI SEMBALAN; *Ridley* 10028. PENANG; *Curtis* 7094.—DISTRIB. Sumatra, Java.

B. bombycina, Bl. (Enum. Pl. Jav. 97) is possibly identical with this; it has been reduced here by De Candolle and part of it is no doubt so reducible. Under *B. bombycina* however have been distributed specimens of an allied species with larger flowers in short spreading cymes. Which of the two plants Blume intended as his *B. bombycina*, it is impossible from his short description and in the absence of authentic specimens to determine.

3. BEGONIA ISOPTEROIDEA, King n. sp. Caulescent, 3 feet high, glabrous. *Leaves* thin, very obliquely ovate-lanceolate acuminate; the base acute on one side of the petiole but with a broad round auricle on the other, the edges remotely lobulate-dentate; lower surface with very minute white scales; main-nerves 7, radiating from the base, rather prominent beneath; length 3·5 to 4·5 in.; breadth 1·2 to 1·5 in.; petioles unequal, 2 to 3·5 in long. *Stipules* broadly lanceolate, acute, ·5 to ·75 in. long. *Peduncles* slender, axillary, about an inch long and bearing about two flowers on long slender pedicels and one sub-sessile. *Flowers* pink, large. MALES; *sepals* 2, rotund-oblong, blunt, ·75 in. long; *petals* 2 similar but only ·5 in. long; *stamens* inserted on an elongate anthophore, the anthers quadrate, 2-groved, truncate, only about half as long as the slender filaments. FEMALES nearly as large as the males; *style* short, thick, divided into 3 slender, bifid spiral spreading branches. *Capsules* about ·75 in. in length and breadth, 3-celled, its wings narrow oblong, thin, membranous, the posterior narrower than the lateral.

PERAK; on Gunong Brumban, elevation 5,000 feet; *Wray* 1548.

A species in leaves capsules and habit resembling *B. isoptera*, but with much larger flowers.

4. BEGONIA SINUATA, Wall. Cat. 3680. Shortly caulescent (from 2·5 to 12 inches high) the rootstock tuberous. *Leaves* either broadly

reniform and blunt, or sometimes with a short broad abrupt apiculus, the basal sinus deep and the edges wavy and minutely denticulate or crenate; or reniform-cordate, gradually tapered to the sub-acute apex, the margins slightly lobulate-dentate, the lobes denticulate, the basal sinus small: length of the reniform over 4 to 6 in.; breadth 5 to 8 in., of the ovate-reniform 1·5 to 3 in.; breadth 1 to 3 in.; petioles of the radical leaves 1 to 3 in.; of the cauline ·5 to 2·5 in.; both surfaces with numerous adpressed white stellate hairs, the lower with small oblong white scales also; main-nerves 7 to 11, radiating from the base, prominent on the lower surface; petioles unequal, ·5 to 3 in. long, pubescent. *Stipules* small, oblong-lanceolate, slightly oblique, blunt, glabrous. *Inflorescence* 3 to 8 inches long, sparsely stellate-puberulous; the peduncle very slender; branches few, short, filiform, few-flowered; bracts minute (·05 to ·1 in. long) bluntly lanceolate, rather densely adpressed-pubescent externally, the upper in whorls of three. *Flowers* small, pink, glabrous. MALES about ·2 to ·25 in. in diam.: *sepals* 2, roundish; *petals* 2, narrower, obovate; *stamens* about 20, monadelphous; anthers obovoid, connective not produced. FEMALE *perianth*-segments 5, the inner gradually smaller. *Styles* 2, combined for half their length, *stigmas* lunate. *Capsule* about ·3 in. broad and slightly longer, the posterior wing the largest. *Seeds* ovoid, shining, brown, deeply pitted. A. DC. Prod. XV, Pt. I, 354; Kurz in Journ. As. Soc. Beng., 1877, Pt. II, 108; Clarke in Hook. fil. Fl. Br. Ind. II, 650. *Diploclinium biloculare*, Wight Ic. 1814. *Begonia guttata*, *elongata* et *subrotunda*, Wall. Cat. 3671 B (*not* A), 6291, 6293.

PENANG; *Wallich*; *Phillips*; *King's Collector* 2269, 4860; *Curtis* 390, 481, 3098; *Ridley* 9229. MALACCA; *Maingay* (K.D.) 674. PERAK; *King's Collector* 4971.—DISTRIB. BURMA; *Griffith*, *Parish*.

5. BEGONIA ANDAMENSIS, Parish ex Clarke in Hook. fil. Fl. Br. Ind. II, 650. Like the reniform-leaved form of *B. sinuata*, but the hairs on the surfaces of the leaves scanty: the inflorescence usually longer and its peduncle and branches much stouter; the bracts glabrous, longer (·35 to ·5 in.) and blunter and the male flowers (·5 in. across) and capsules (·6 in. across) longer and more numerous than those of *B. sinuata*.

ANDAMAN ISLANDS; *Parish*; *King's Collector*.—DISTRIB. Burma.

This ought probably to be regarded as a variety of *B. sinuata*. Actual specimens of the two look more different than written descriptions lead one to suppose; I therefore retain this as a species.

6. BEGONIA DEBILIS, King n. sp. A slender weak herb, about 6 to 8 inches high, caulescent. *Leaves* thin, narrowly reniform, blunt or sub-acute; the base unequal, rounded at both sides but one auriculate and

much longer; edges sub-entire or slightly remotely and obscurely crenate; breadth 1·5 to 3 in.; length (from base of largest lobe to apex) 3·5 to 7 in.; upper surface glabrous, the lower minutely scaly; main-nerves 7, radiating from the base, some of them branching, rather prominent below; petioles 1 to 3 in. long. *Inflorescence* axillary or terminal, slender, longer than the leaves, with a few lax filiform dichotomous spreading few-flowered branches, bracts in pairs, ovate-lanceolate, ·1 to ·15 in. long. *Flowers* pure white, the stamens yellow. MALE ·35 in. across; *sepals* 2, oblong-ovate, blunt: *petals* 2, similar but smaller; *stamens* in a globular mass; anthers obovate, short with broad emarginate inappendiculate apices. FEMALE *perianth* of 5 unequal obliquely oblong pieces; *styles* united into a short column, above divided into numerous crowded awns. *Capsule* ·75 in. broad (to the end of the wings), and ·4 in. from base to apex, glabrous, 2-celled: the 2 lateral wings triangular, acute, the posterior wing oblong, tapering a little to the blunt apex, more than twice as long as the lateral.

PERAK; *King's Collector* 8289.

A species allied to *B. varians*, A. DC., but with more entire leaves.

7. BEGONIA THAIPINGENSIS, King n. sp. *Rhizome* long, creeping, rooting at intervals, wire-like, rusty-villous. *Leaves* rotund-reniform, the edges minutely and rather remotely dentate, the basal sinus mostly obliterated by the overlapping of the auricles; both surfaces scaly the lower more distinctly so and rusty tomentose on the 6 or 7 radiating sub-prominent nerves; length 1·25 to 2 in.; breadth 1·5 to 2·25 in.; petioles unequal, 1 to 4 in. long, densely rusty-tomentose. *Peduncles* 4 to 9 in. long, slender, sparsely rusty-villous, bearing one or two remote pairs of small lanceolate bracts and near the apex 3 to 5 slenderly pedicellate pink flowers on slender branches. MALE flowers; *sepals* 2, sub-rotund, ·15 in. long; *petals* 2, smaller, oblong; *stamens* numerous; *anthers* obovate, the apex blunt and emarginate, the filaments short. FEMALE *perianth* of 5 unequal pieces, the largest most external: *style* short, thick, with 2 stout arms and short thick twisted stigmas. *Capsule* 2-celled, ·5 in. broad (to the ends of the wings); all the wings triangular, sub-equal.

PERAK; *Scortechini* 1479; *Wray* 1774; *King's Collector* 2523, 8511.

A species allied to *B. sinuata*, Wall., but differing by the creeping rhizome, non-apiculate leaves, rusty-tomentose petioles and peduncles.

8. BEGONIA GUTTATA, Wall. Cat. 3671 A. *Stem* succulent, short, weak, bearing about two thin obliquely ovate-reniform glabrous nearly entire *leaves* with oblique cordate bases, and subacute apices; the nerves about 5, radiating from the base, prominent, sparsely hairy;

4 to 7 in. long and 2 to 4·5 in. broad; petioles 1·5 to 4 in. *Peduncles* varying in length from 1 to 2 in., slender, glabrous, bearing a few flowers near the apex. MALE flower; *sepals* 2, rotund; petals 2, narrowly oblong; *stamens* about 50, monadelphous; *anthers* obovoid. FEMALE; *perianth*-segments 5, gradually smaller inwards: *styles* 2, with two twisted branches. *Capsule* ·4 in. long and ·75 in. broad to the ends of the wings, the smaller wings very narrow; the posterior one broad, descending. A. DC., Prod. XV, Pt. I, 352; Clarke in Hook. fil. Fl. Br. Ind. II, 648.

PERAK; *Scortechini* 571. MALACCA; *Maingay* (Kew Distrib.) 675. PENANG; *Wallich*. SELANGOR; *Ridley* 7289.

9. BEGONIA HASSKARLII, Zoll. et Mor. Syst. Verz. Zoll. 31 (*not of Miq.*) All parts glabrous. *Stem* a creeping rhizome. *Leaves* rotund-ovate, shortly and abruptly caudate-acuminate, peltate, the edges wavy but entire; both surfaces glabrous, the upper pitted when dry, the lower with sub-rotund scales; main-nerves about ten, radiating from the insertion of the petiole, not very prominent; length 3·5 to 5·5 in.; breadth 2·25 to 3·75 in.; petiole attached to the leaf about ·75 to 1·25 in. from its lower edge; *stipules* short, lanecolate. *Peduncle* usually longer than the leaves (often twice as long), about as thick as the petioles, bearing a few slender branches near the apex, ebracteate. *Flowers* small, white tipped with red. MALE ·2 in. broad; *sepals* 2, reniform, the margins thick. *Stamens* numerous, cuneiform-oblong, their apices emarginate; filaments very short, free. FEMALE, *sepals* 2, with vertical veins, reniform; *style* short, thick, with 4 short branches; *stigmas* 4, much lobulate. *Capsule* 4-celled, ·6 in. long, the lateral wings very narrow; the posterior broad slightly narrowed to the blunt apex, ·5 in. long: *seeds* minute, ovoid, tapering to one end, brown, shining, pitted. *B. peltata*, Hassk. in Hoev. et De Vriese, Tijdschr. X (1843) 133. *Metscherlicia coriacea*, Klotzsch in Abh. Akad. Berl. (1855) 74; Miq. Fl. Ind. Bat. I, Pt. I, 696. *B. coriacea*, Hassk. Pl. Jav. Rar. 209; *B. hernandiaefolia*, Hook. (not of others) Bot. Mag. t. 4676.

PERAK; *Scortechini* 1607; *King's Collector* 4427, 8245; *Ridley* 9689. PAHANG; *Ridley* 2442.—DISTRIB. Java, *Zollinger* 1613.

This is one of three species to which the specific name *peltata* has been given. That name must however be reserved for the Brazilian species to which it was first applied by Otto & Dietr. (Allg. Gartenz. IX (1841) 58). The MSS. name *B. Hasskarliana* was given by Miquel to a species near *B. coespitosa* which he confused with Zollinger's No. 1613 (the type of the species above described), and this inaccuracy was perpetuated by Miquel on p. 1091 of his Fl. Ind. Bat. I, Pt. I, where he describes *Diploclinium Hasskarlianum*.

10. BEGONIA SCORTECHINII, King, n. sp. *Rhizome* creeping, short, scaly.

Leaves on very long glabrous petioles, narrowly lanceolate, attenuate to the acuminate apex, and to the rounded or acute nearly equal-sided base; the edges dentate-ciliate; both surfaces with numerous scattered coarse subulate spreading hairs compressed at their bases, the lower also minutely scaly; main-nerves pinnate, 3 or 4 pairs, then ascending; length 2·75 to 4 in.; breadth ·5 to 1 in.; petioles 5 to 7 in. *Peduncles* axillary, somewhat shorter than the leaves, glabrous, bearing at the apex 2 few-flowered branches and a few rather long bracts. *Flowers* white, tinged with pink and green. MALE: *sepals* ovate, obtuse, ·75 in. long; *petals* narrower but nearly as long. *Stamens* numerous, in a short column; anthers linear-oblong, the apical appendage obtuse; filaments short. *Female* with perianth-segments similar to the male (*fide* Scortechini) but 5. *Ovary* glabrous, 2-celled; *styles* free, 2 to 4-fid. *Capsule* ·75 in. broad (including the wings) the lateral wings narrow, oblong, the posterior much larger (*fide* Scortechini).

PERAK; *Scortechini* 1845; *King's Collector* 7227.

I have seen no ripe capsules, and the above description of them is taken from Scortechini's field-note. The species is readily distinguishable by its very narrow equal-sided coarsely hairy leaves. A drawing of this, sent to Herb. Kew from Penang by Mr. C. Curtis, represents the leaf-petioles as not more than one inch long.

11. BEGONIA KUNSTLERIANA, King n. sp. *Rhizome* creeping, very scaly. *Leaves* ovate-lanceolate to lanceolate, often but not always unequal-sided, much acuminate; the base cuneate usually oblique; edges ciliate-serrate, the teeth slightly unequal; both surfaces with coarse spreading hairs with dilated flattened bases; the lower with minute white scales also; main-nerves about 3 pairs, pinnate, densely rufescent villous like the petioles; length 5 to 7·5 in.; breadth 1·75 to 2·5 in.; petiole from half as long to nearly as long as the blade. *Peduncles* longer than the petioles and more slender, glabrous, 2- to 4-flowered at the apex. *Flowers* large, white, tinged with red. MALE; *sepals* 2, elliptic, obtuse, 1 in. long and ·5 in. broad, vertically veined; *petals* similar but not half so large. *Stamens* numerous, linear-oblong, bluntly apiculate. FEMALE *perianth* of 5 oblong blunt segments; *styles* 2, each with two short twisted branches. *Capsule* (to the end of the posterior wing) 1 in. broad: the lateral wings short, narrow; the posterior elongate not tapered to the apex, 2-celled. *Seeds* ellipsoid, shining, brown, pitted.

PERAK; *King's Collector* 7194; *Scortechini*; *Ridley* 9651.

This resembles *B. Scortechinii*, but has larger leaves and shorter petioles which are densely villous.

12. BEGONIA HERVEYANA, King n. sp. Glabrous except for a few

hairs on the nerves on the lower surface of the leaves: *rhizome* creeping, thin. *Leaves* broadly elliptic-ovate, shortly acuminate, slightly narrowed to the rounded almost equal-sided base; the edges slightly undulate, very indistinctly serrate; upper surface glabrous, lower very minutely scaly; nerves pinnate, about 6 pairs, ascending, branching; length 5 to 9 in.; breadth 3 to 4·5 in.; petioles much longer than the leaves, glabrous; *stipules* lanceolate, inconspicuous. *Peduncles* 5 to 10 in. long, slender, bearing near the apex 2 or 3 branches with few shortly pedicellate flowers. Male *flowers; sepals* 2, ovate-subrotund; *petals* 2, much smaller, oblong, blunt; *stamens* numerous, arranged in a cone, linear, with a blunt apical appendage, the filaments short. Female *perianth* of 5 subrotund pieces. *Capsule* 1 in. broad and about half as much from base to apex, imperfectly 4-celled: lateral wings narrow oblong; the posterior wing ovate, blunt, about ·65 in. long.

Malacca; *Hervey*; *Derry*.

This is a very distinct species resembling in the shape of its leaves no Asiatic *Begonia* that I have seen, except on unnamed species from Tonkin (No. 3763 of Herb. Balansa).

13. Begonia perakensis, King n. sp. *Rhizome* slender, creeping. *Leaves* ovate-lanceolate, slightly unequal-sided, acuminate; the base broad, rounded or very slightly emarginate or oblique, the edges obscurely and remotely dentate, or sub-entire; both surfaces glabrous, the lower minutely scaly; main-nerves pinnate, 4 or 5 pairs, ascending; length 3·5 to 5·5 in.; breadth 1·5 to 2·25 in.; petiole 2·5 to 5 in.; slender, glabrous. *Peduncles* usually longer than the leaves (at least when in fruit), 4-angled, glabrous, few-flowered. *Flowers* whitish tinged with pink, or pink. Male; *sepals* rotund-ovate, ·4 in. long. *Petals* 2, oblong and much smaller. *Stamens* numerous, linear with short blunt apical appendages and short filaments. Female *perianth* of 5 (?) segments. *Capsule* (ripe) 1·2 in. broad (to end of posterior wing), and ·5 in. from base to apex, 2-celled; the lateral wings oblong, narrow; the posterior oblong, blunt, slightly oblique, ·35 in. broad; *seeds* small, ellipsoid, pitted, shining.

Perak; *King's Collector* 10338, 10506, 10951.

Specimens of a species closely resembling this, but insufficient for accurate determination, have been collected in Selangor by Mr. Ridley (Herb. Ridley 8590).

14. Begonia paupercula, King n. sp. *Rhizome* creeping, acaulescent, everywhere glabrous. *Leaves* ovate, very unequal-sided and very oblique at the base, or ovate-lanceolate, slightly unequal-sided and little oblique at the base; the apex always acuminate, the edges slightly sinuate-lobed, obscurely dentate; both surfaces glabrous: main-nerves 5 to 7, radiating from the base, prominent below, midrib with a few

lateral nerves, length 3·5 to 5 in.; breadth 1·25 to 3·5 in.; petioles varying in length from 2·5 to 7 in., slender, 2-to 3-flowered. *Flowers* white, tinged with red. MALES; *sepals* 2, elliptic-oblong, ·4 in. long; *petals* 0. *Stamens* linear-oblong, shortly and bluntly apiculate: filaments short. FEMALE; the *perianth* of 5 very unequal lobes, the outermost larger than the sepals of the male. *Capsules* ·6 in. long and 1 in. broad, 2-celled; the 2 lateral wings sub-elliptic, oblique, ·3 in. broad; the posterior wing oblong, blunt, ·6 to ·7 in long and ·35 in. broad.

PERAK; *King's Collector* 5952.

This has leaves resembling those of *B. borneensis*, but the flowers are fewer and larger. Beccari's Sumatra specimens (P.S. 857), in fruit only, appear to belong to this species.

15. BEGONIA VENUSTA, King n. sp. *Rhizome* slender, creeping; whole plant glabrous. *Leaves* reniformly ovate, shortly acuminate, the basal sinus deep; the edges sub-entire or remotely and minutely denticulate; both surfaces smooth, shining: main-nerves 7, radiating from the base, slender; length 3 to 5·5 in.; breadth 2 to 3·5 in.; petioles unequal, slender, from 6 to 12 in. in length. *Peduncles* 3·5 to 6 in. long, bearing about 3 pedunculate pinkish-white flowers near the apex. MALE; *sepals* 2, ovate-rotund, blunt, ·75 in. long. *Petals* 2, somewhat larger. *Stamens* narrowly oblong, with a large apiculus; filaments unequal, the inner ones long, the outer short. FEMALES smaller than the male, the *perianth* of 5 unequal broad blunt segments; *styles* very short, with numerous broad depressed lobules. *Capsule* ·3 in. long and 1·15 in. broad (to the ends of the wings); lateral wings more than half as long as the posterior, broadly triangular, blunt; posterior wing oblong, blunt, ·7 in. long.

PERAK; at an elevation of about 6,000 ft., *Wray* 1598.

The leaves are not unlike those of *B. paupercula* and *B. borneensis* but the flowers are large and handsome.

16. BEGONIA MEGAPTEROIDEA, King n. sp. *Rhizome* as thick as a swan-quill, creeping on rocks. *Leaves* broadly and very obliquely ovate, acuminate; both sides of the base rounded but very unequal, the sinus between them wide, the edges remotely and minutely dentate, upper surface glabrous; the lower also glabrous except the rusty-pubescent nerves which are also scaly near the base: main-nerves about 8, radiating from the base, the larger branched and all rather prominent; length (from ap of petiole to apex of blade) 4 to 5 in.; breadth 4 to 5 in.; petiole 12 to 16 in. long, glabrous. *Peduncles* from half as long to nearly as long as the leaves, glabrous, ebracteate below the flowers. MALE flowers: *sepals* rotund-ovate, very obtuse, 1 in. long and ·6 to ·7 in. broad; *petals* much smaller, elliptic: *stamens* numerous, in a conical

mass on a short thick anthophore; *anthers* oblong, bluntly apiculate, filaments varying in length (the inner the longest). FEMALE *perianth* of 5 unequal pieces: *styles* 2, rather long, combined at the base. *Capsule* not seen.

PERAK; collected at an elevation of 5,000 ft., *Wray* 1450, 1573.

Specimens of this plant are rather scanty. They resemble *B. megaptera*, but are not caulescent like that species. In the Calcutta Herbarium there is, under the name *Diploclinium tuberosum*, Miq., a specimen collected by Kurz in Western Java which apparently belongs to this species. There are also two plants from Sumatra collected by Forbes (Herb. Forbes 2333*a* and 2255) which appear to belong to this. The genus *Diploclinium* is inseparable from *Begonia* and the specific name *tuberosa* is pre-occupied in the latter by a species described by Lamack from the Moluccas which has a rounded tuberous root.

17. BEGONIA MAXWELLIANA, King n. sp. *Rhizome* as thick as a swan-quill, bearing many broadly lanceolate scales. *Leaves* broadly and obliquely ovate to ovate-rotund, more or less acuminate, the edges minutely ciliate-denticulate, the base very oblique, one side of it rounded the other rounded-auriculate, the sinus wide; both surfaces with a few coarse compressed rusty hairs, most numerous on the nerves near the base; the lower surface with minute white scales; main-nerves 7 to 9, radiating from the base, prominent; length 5 to 6 in.; breadth 4 to 7 in.; petioles 4 to 10 in. long, compresed (when dry) like the peduncles and like them rusty-pubescent. *Peduncles* unequal, those bearing only male flowers often shorter than the petioles; those bearing female and male, or females only often longer than the petioles; all ebracteate below the inflorescence, dichotomously branched and few-flowered at the apex; the bracts short, broad. MALE flowers densely clustered; *sepals* 2, oblong-ovate, blunt, ·4 in. long, puberulous outside; *petals* 2, similar, but much smaller. *Stamens* numerous, without anthophore; anthers linear, bluntly apiculate, slightly shorter than the filaments. FEMALE *perianth* of 5 unequal pieces diminishing in size inwards; *styles* 2, short, much lobulate. *Capsule* 2-celled, 1·4 in. broad (to the ends of the wings) and ·6 in from base to apex; the 2 lateral wings sub-quadrate, obtuse; the posterior oblong, blunt, more than three times as long as the lateral.

PERAK; Maxwell's Hill, at elevation of 3,000 feet, *Wray* 119, 2199; *Scortechini* 1607, 1798; *King's Collector* 2038.—DISTRIB. Sumatra, *Forbes* 3119*a*.

The flowers of this are white tinged with pink and the leaves green, the nerves beneath being red. This resembles B. *megapteroidea*, King, but the flowers are smaller, and the leaves and inflorescence are not glabrous as in that species.

18. BEGONIA PRÆCLARA, King n. sp. *Rhizome* creeping, very scaly. *Leaves* obliquely ovate, acuminate, the base rounded on one side of the

petiole and on the other expanding into a broad rounded auricle, the edges minutely dentate, rarely with small lobes besides: upper surface with numerous conical papillæ each bearing a coarse curved hair flattened at the base; under surface with a few scattered flattened hairs especially on the nerves; main-nerves 7, radiating from the base, prominent beneath; length 3·5 to 5·5 in.; breadth 2·5 to 3·5 in.; petioles unequal 3 to 6 in. long, with a few flexuose hairs near the apex. *Peduncles* longer than the petioles, slender, glabrous, 1- to 3-flowered. *Flowers* on rather long slender pedicels, pink. MALES; *sepals* 2, narrowly oblong-ovate, obtuse, ·8 in. long; *petals* 2, narrowly oblong, blunt, ·5 in. long; *stamens* linear-oblong, apiculate, the filaments unequal the central the largest. FEMALE perianth unknown; *styles* 2, short, 2-branched, branches divided into many flat twisted lobes. *Capsule* ·5 in. long and about 1·5 in. broad (to the ends of the wings); the lateral wings quadrate-ovate, obtuse, about ·4 in. long; the posterior oblong, blunt, 1 in. long and ·4 in. broad.

PERAK; at elevations of from 3,000 to 6,700 feet, *Wray* 318, 349, 427; *King's Collector* 8077.

The upper surface of the leaves is dark green, the nerves being coloured; the under surface is red of various tints and the flower-stalks are pale crimson.

19. BEGONIA LOWIANA, King n. sp. Caulescent; 3 feet high; stems and branches covered with coarse flexuose glandular hairs. *Leaves* mostly very obliquely reniform; but some of the cauline ovate and nearly equal-sided acute, the basal sinus deep, the edges with a few very shallow lobes closely and rather minutely dentate-serrate and shortly ciliate; both surfaces coarsely rusty-pubescent, the hairs flexuose compressed and with dilated bases, the lower also with small white scales; main-nerves about 9, radiating from the base, prominent and densely villous; length 3 to 4·5 in.; breadth 4 to 7 in.; petioles unequal, stout, villous like the under surface of the ribs and midrib, from ·4 in. long in the upper leaves, to 4 in. long in the lower. *Cymes* few-flowered, leaf-opposed and terminal, shorter than the leaves when in flower, much larger when in fruit; bracts ovate-lanceolate, opposite, ciliate. *Flowers* pink or white, pedicellate. MALE about ·75 in. across; *sepals* 2, ovate-oblong, sub-acute, ·5 in. long; *petals* 2, oblong, much smaller. *Stamens* numerous, oblong, blunt, without apical appendages; filaments short. FEMALE, the *perianth* of 5 pieces decreasing in size inwards; *styles* 2, deeply bifid and spiral. *Capsules* ·65 in. long and twice as broad to the end of the wings; lateral wings very narrow (about ·15 in. broad), the posterior oblique, broadly ovate, blunt, ·9 in. long and ·8 in. broad.

Perak; at an elevation of 7,000 feet on Gunong Brumber Pahang, *Wray* 1567; also on Gunong Batu Puleh, *Wray* 316.

This resembles the Indian species *B. Thomsonii*, DC., but differs in being caulescent, in having shorter hairs on leaves and petioles, and in the posterior wing of the capsule being much larger. I have named the species after Sir Hugh Low, late British resident at Malacca, to commemorate his many services towards the botanical exploration of the Province of Perak.

Order LIV. FICOIDEÆ.

Herbs. *Leaves* simple, often fleshy, usually opposite or whorled; stipules 0 or scarious. *Flowers* usually in cymes or clusters, rarely solitary, regular, hermaphrodite rarely polygamous. *Calyx* of 4-5 segments, united into a tube or nearly distinct, free from the ovary in the Indian genera, often persistent. *Petals* usually wanting, when present small. *Stamens* perigynous or hypogynous, definite or indefinite; staminodes sometimes present. *Ovary* free (except in *Mesembryanthemum*), 2-5-celled, syncarpous (except in *Gisekia*); styles as many as the carpels: ovules numerous in each carpel and axile or solitary and basal. *Fruit* usually capsular, splitting dorsally or circumsciss, more rarely the carpels separate into cocci. *Seeds* many or 1 in each carpel, usually reniform, compressed; embryo curved or annular, surrounding the farinaceous albumen, radicle next the hilum.—Distrib. Species 450, chiefly African, a few are scattered through most tropical and subtropical regions.

Capsule with circumscissile dehiscence	...	...	1. Sesuvium.
Capsule with dorsal dehiscence	...	...	2. Mollugo.

1. Sesuvium, Linn.

Succulent branching herbs. *Leaves* opposite, fleshy; stipules 0. *Flowers* axillary, sessile or peduncled, solitary, rarely in cymes. *Calyx-tube* short; lobes 5, triangular-lanceolate, persistent, often coloured. *Petals* 0. *Stamens* many or 5, inserted round the summit of the calyx-tube. *Ovary* free, 3-5-celled; styles 3-5; ovules many, axile. *Capsule* ovate-oblong, membranous, 3-5-celled, circumsciss. *Seeds* many in each cell, reniform; embryo annular.—Distrib. Species 4, littoral in warm climates.

Sesuvium Portulacastrum, Linn. Syst. ed. 10, 1058. Creeping and rooting in the sand, glabrous. *Leaves* linear-spathulate almost cylindric, sometimes sub-obovate: gradually narrowed into a short petiole with dilated scariously margined base. *Flowers* solitary, axillary, their pedicels ·25 in. long. *Calyx* rose-coloured inside. *Stamens* 15 to 40, free or almost free. *Styles* 3 to 5. *Capsule* ·2 in. across. *Seeds* black, shining, smooth, not numerous. Roxb. Fl. Ind. II, 509; Dalz. & Gibs. Bomb.

Fl. 15; Kurz in Journ. As. Soc. Beng. 1877, Pt. II, 110: Clarke in Hook. fil. Fl. Br. Ind. II, 659. *S. repens*, Willd. Enum. p. 511; DC. Prod. III, 453: W. & A. Prod. Fl. Pen. Ind. 361; Wight in Hook. Comp. Bot. Mag. II, 71, t. 23; Miq. Fl. Ind. Bat. I, Pt. I, 1060. *Psammanthe marina*, Hance in Walp. Ann. II, 660. *Crithmum indicum*, Rumph. Herb. Amb. VI, t. 72, fig. 1.

On the sea shores in the Andamans and the other Provinces.—Distrib. B. India, Malayan Archipelago.

2. Mollugo, Linn.

Herbs, branched, often dichotomous. *Leaves* often falsely whorled, or alternate, or all radical, from linear to obovate, entire; stipules fugacious. *Flowers* axillary, sessile or pedicelled, clustered or in panicles or racemes, small, greenish; bracts inconspicuous. *Sepals* 5, persistent. *Petals* 0; staminodes 0 or small in the same species. *Stamens* 5-3, rarely many. *Ovary* free, globose or ellipsoid, 3-5-celled; styles 3-5, linear or very small; ovules many, axile. *Capsule* membranous, sheathed by the sepals, 3-5-celled, dehiscing dorsally. *Seeds* several in each cell, rarely 1, reniform, appendaged or not at the hilum; embryo annular.—Distrib. Species 12, tropical and subtropical.

Mollugo pentaphylla, Linn. Spec. Plantar. ed. 1 (1753), 89. A few inches high, glabrous; stems much-branched, leafy, varying from oblong-lanceolate, lanceolate-acute to obovate-obtuse, contracted at the base, subsessile or sessile, from less than ·5 in. to more than 2 in. in length. *Panicles* compound, terminal, many times longer than the leaves. *Sepals* elliptic or rotund, blunt. *Stamens* 3 to 5, short; filaments rather broad, compressed. *Capsule* globose, as long as the sepals, thin-walled, many seeded. *Seeds* dark-brown, tubercled; embryo curved. W. & A. Prodr. 44; Dalz. & Gibs. Bomb. Fl. 16; Kurz in Journ. As. Soc. 1877, Part II, 111. *M. triphylla*, Lour. Fl. Cochinc. 79; DC. Prodr. I, 392; Roxb. Hort. Beng. 9, Fl. Ind. I, 360; Wall. Cat. 651; W. & A. Prodr. 44. *M. Linkii*, Seringe in DC. l.c. *M. stricta*, Linn. Sp. Pl. ed. II, 131; DC. Prodr. I, 391; Roxb. l.c.; Wall. Cat. 650; W. & A. Prodr. 44; Dalz. & Gibs. l.c.; Clarke in Hook. fil. Fl. Br. Ind. II, 663: *Pharnaceum strictum*, *triphyllum* and *pentaphyllum*, Spreng. Syst. I, 949.—Rheede Hort. Mal. x. t. 26.

In all the Provinces, near cultivated places.—Distrib. General throughout S. E. Asia.

Order LV. UMBELLIFERÆ.

Herbs (rarely in non-Indian species shrubs or trees). *Leaves* alternate, usually divided or dissected, sometimes simple, petiole generally

sheathing at the base; stipules 0. *Flowers* hermaphrodite or polygamous, in compound umbels (simple in *Hydrocotyle* and *Bupleurum*), exterior of the umbel sometimes radiant; umbels with involucriform bracts at the base of the general one and bracteoles at the base of the partial ones (umbellules). *Calyx-tube* adnate to the ovary, limb 0 or 5-toothed. *Petals* 5, epigynous, often unequal, and with a median fold on the face, plane or emarginate or 2-lobed with the apex inflexed; imbricated in bud, in *Hydrocotyle* sometimes valvate. *Stamens* 5, epigynous. *Ovary* inferior, 2-celled, disc 2-lobed; styles 2, stigmas capitellate; ovules 1 in each cell, pendulous. *Fruit* of 2 indehiscent dorsally or laterally compressed carpels, separated by a commissure; carpels each attached to and often pendulous from a slender often forked axis (carpophore), with 5 primary ridges (1 dorsal, 2 marginal and 2 intermediate) and often 4 secondary ones intercalated between these; pericarp often traversed by oil-canals (vittæ). *Seed* 1 in each carpel, pendulous, albumen cartilaginous; embryo small, next the hilum, radicle superior.—Distrib. Species about 1,500, mainly in Europe, North Africa, West Central and North Asia; a few are North American, tropical, and natives of the Southern Hemisphere.

Creeping unarmed herbs	...	...	...	1. Hydrocotyle.
Erect spinous herbs	...	...	...	2. Eryngium.

1. Hydrocotyle, Linn.

Prostrate herbs, rooting at the nodes. *Leaves* (in the Indian species) cordate or hastate, not peltate, round or 5–9-gonal, subentire or palmately lobed, palmate-nerved, long-petioled; stipules small, scarious. *Umbels* (in the Indian species) simple, small; bracts small or 0; flowers white, sometimes unisexual. *Calyx-teeth* 0 or minute. *Petals* entire, valvate or imbricate. *Fruit* laterally compressed, commissure narrow; carpels laterally compressed or sub-pentagonal; lateral primary ridges concealed within the commissure, or distant therefrom and prominent; vittæ 0, or most slender, obscure; carpophore 0. *Seed* laterally compressed.—Distrib. Species 70; in wet places in tropical and temperate regions, more numerous in the Southern Hemisphere.

Petals acute, valvate; fruit with no secondary ridges; pericarp thin	...	...	...	1. *H. javanica.*
Petals obtuse, imbricate; fruit with prominent secondary ridges, the pericarp thickened	...	...	...	2. *H. asiatica.*

1. Hydrocotyle javanica, Thunb. Dissert. Hydrocot. n. 17, t. 2: ed. Pers. II, 415, t. 2. *Leaves* reniform, 5–6-lobed, the lobes irregularly crenate, sometimes sub-entire, 1 to 3 in. broad. *Peduncles* long, slender, often clustered. *Petals* acute, valvate. *Fruit* much compressed, the

secondary ridges absent; pericarp thin, blackish. DC. Prodr. IV. 67; Miq. Fl. Ind. Bat. I. Pt. I, 734; Kurz in Journ. As. Soc. 1877, Pt. II. 113; Clarke in Hook fil. Fl. Br. Ind. II, 667. *H. hispida*, Don Prodr. 183. *H. nepalensis*, Hook. Exot. Fl. t. 30; Wall. Cat. 561; DC. l.c. 65; Miq. l.c. 735. *H. zeylanica*, DC. l.c. 67; W. & A. Prodr. 366; Miq. l.c. 734. *H. hirsuta*, Blume Bijd. 884. *H. polycephala*, W. & A. Prodr. 366; Wight. Ic. t. 1003. *H. hirta*, R. Br. var. *acutiloba*, F. Muell.; Benth. Fl. Austral. III. 340. *H. Heyneana*, Wall. Cat. 563. *H. strigosa*, Ham. in Wall. Cat. 7219.

Perak; and probably in all the other provinces except the Andaman and Nicobar Islands.—Distrib. The Malay Archipelago, Australia, Philippines.

2. Hydrocotyle asiatica, Linn. Sp. Pl. 234. *Leaves* rotund-reniform, the margins not lobed but uniformly crenate or dentate, sometimes sub-entire, ·5 to 2 in. broad. *Peduncles* short, often 2 or 3 together. *Petals* obtuse, imbricate. *Fruit* compressed, secondary ridges prominent, pericarp thickened. Roxb. Hort. Beng. 31: Fl. Ind. II, 88; Wall. Cat. 560; DC. Prodr. IV, 62; W. & A. Prodr. 366; Wight Ic. t. 565; Dalz. & Gibs. Bomb. Fl. 105; Kurz in Journ. As. Soc. 1877, Pt. II, 113; Clarke in Hook. fil. Fl. Br. Ind. II, 669. *H. Wightiana*, Wall. Cat. 7220. *H. lurida*, Hance in Walp. Ann. II, 690.—Rheede Hort. Mal. X. t. 46.

Andaman Islands; Perak.—Distrib. Tropical and sub-tropical regions.

2. Eryngium, Linn.

Spinescent, glabrous, erect, perennial *herbs* (the Indian species). *Leaves* spinous-toothed, entire lobed or dissected. *Flowers* in simple heads, each bracteolate; bracts whorled, spinulose (in Indian species). *Calyx-tube* covered with ascending hyaline scales; teeth rigid, acute. *Petals* whitish, narrow, erect, emarginate, scarcely imbricate. *Fruit* ellipsoid, nearly cylindric: carpels dorsally subcompressed, subconcave on the inner face; primary ridges obtuse not prominent, secondary 0; vittæ in the primary ridges inconspicuous or 0, with some very slender scattered in the endocarp: carpophore 0. *Seed* semi-terete, dorsally subcompressed, subconcave on the inner face.—Distrib. Species 100, temperate and tropical; plentiful in Western Asia.

Eryngium fœtidum, Linn. Sp. Pl. 232, (*in part.*) Erect, unbranched below, dichotomously branched above. *Leaves* radical, oblong-oblanceolate, coarsely serrate, glabrous, 4 to 9 in. long and not more than 1 in. broad. *Bracts* of inflorescence all spinous-toothed; the lower deeply lobed; the upper smaller (about 1 in. long), lanceolate, not

lobed, whorled. *Flowers* in dense cylindric spikes, less than 1 in. long DC. Prodr. IV, 94.

SINGAPORE: *King's Collector* 333.

Order LVII. CORNACEÆ.

Shrubs or trees. *Leaves* opposite or alternate, more or less coriaceous, usually petiolate, entire, rarely serrate or lobed, often unequal at the base, exstipulate. *Flowers* usually small, regular, hermaphrodite or unisexual, in axillary or terminal cymes, panicles or capitules. *Calyx-tube* adherent to the ovary; the limb truncate or 4–5-toothed or lobed, valvate or imbricate, persistent at the apex of the fruit. *Petals* 4-5, sometimes as many as 20, or none, valvate or imbricate. *Stamens* inserted with the petals and equal to them in number, rarely 2 or 3 times as many. *Ovary* inferior, 1–4-celled, crowned by a large fleshy or rarely small disc. *Style* single, long or short; stigma truncate, capitate or pyramidal, sometimes lobed. *Ovules* solitary in each cell (rarely 2), pendulous from the apex. *Fruit* baccate, (the pulp often scanty), usually 1-celled, sometimes as many as 4-celled. *Seed* oblong, pendulous, with copious fleshy albumen; embryo axile minute or often large with flat leafy cotyledons.—DISTRIB. Species about 90, widely scattered but most abundant in the temperate regions of the Northern Hemisphere.

Flowers hermaphrodite:—	
Petals not larger than the lobes of the calyx; anthers short, ovate and cordate; style short	1. MASTIXIA.
Petals much longer than the lobes of the calyx; anthers long, linear; style elongate	2. ALANGIUM.
Flowers unisexual	3. NYSSA.

1. MASTIXIA, Blume.

Trees, young parts more or less pubescent. *Leaves* alternate or opposite, petioled, entire. *Flowers* hermaphrodite, often 2-bracteolate, small, in terminal many-flowered cymose panicles; bracts small or lengthened, pedicels short or 0, jointed under the flower. *Calyx-tube* campanulate, pubescent or silky; limb 5–4-toothed. *Petals* 5–4, ovate, leathery, valvate, pubescent, silky. *Stamens* 5–4; anthers cordate-oblong. *Ovary* 1-celled; disc fleshy; style cylindric, simple; ovule 1, pendulous from one side of the cell very near its summit. *Drupe* ellipsoid or ovoid, crowned by the calyx-teeth or a scar; putamen grooved down one face; endocarp protruded inwards down one side. *Seed* ellipsoid; albumen fleshy; embryo small, radicle elongate, cotyledons thin, elliptic.—DISTRIB. Species 18; S. India and Malaya.

Leaves alternate; bracts of the inflorescence dimorphous	1. *M. bracteata.*
Leaves alternate or opposite :—	
Bracts of the inflorescence all small, triangular, concave, puberulous, not in whorls	2. *M. Scortechinii.*
Bracts of inflorescence in whorls at the base of the flower-pedicels, broad	3. *M. gracilis.*
Leaves opposite :—	
Flowers 5-merous	4. *M. Maingayi.*
Flowers 4-merous	5. *M. Clarkeana.*

1. Mastixia bracteata, Clarke in Hook. fil. Fl. Br. Ind. II, 746. A tree 40 or 50 feet high: young branches slender, glabrous. *Leaves* alternate, thinly coriaceous, olivaceous-green when dry, abruptly bluntly and shortly acuminate, the base cuneate; both surfaces glabrous, the lower faintly reticulate; main-nerves 5 or 6 pairs, ascending, curved, impressed on the upper but prominent on the lower surface: length 1·75 to 3 in.; breadth ·75 to 1·35 in.; petiole ·25 to ·5 in. *Cymes* terminal, ·75 to 1·5 in. long, branching, many-flowered, bracteate; the bracts of two sorts; those at the bases of the branches linear-oblong, blunt, 1-nerved, glabrous, longer than the flowers; those at the bases of the flowers much smaller, lanceolate, puberulous. *Flowers* a little over ·1 in. long. *Calyx* funnel-shaped, the tube adpressed-silky outside; the mouth expanded, glabrous, wavy but scarcely distinctly toothed, *Corolla* hemispheric in bud: *petals* adnate by their edges, broadly ovate, silky externally. *Anthers* 5, broadly ovate, cordate at the base; filaments short. *Disc* large, fleshy, 5-toothed, each tooth with an oblong depression in the middle. *Style* short, grooved. *Fruit* unknown.

Malacca: *Maingay* (K.D.) 710. Perak: *Kunstler* 6830.

2. Mastixia Scortechinii, King n. sp. A small tree; young branches slender, angled, glabrous. *Leaves* coriaceous, elliptic-oblong or oblanceolate, much attenuate to the base, the apex shortly and bluntly acuminate; both surfaces glabrous, pale olivaceous when dry, the lower the palest; main-nerves 4 or 5 pairs, ascending, slender; length 1·75 to 2·5 in.; breadth ·85 to 1·25 in.; petiole ·25 to ·5 in. *Cymes* corymbose, terminal, several together, 1·25 to 1·75 in. long, puberulous; the branches short, angled; bracts at the bases of the branches and of the flowers similar, small, triangular, concave, puberulous. *Flowers* sessile; *calyx-tube* narrowly campanulate, the mouth with 5 distinct triangular teeth. *Corolla* depressed-globose in bud. *Petals* 5, puberulous outside, ovate, acute. *Stamens* 5: *anthers* broadly ovate, cordate at the base: filaments short. *Disc* fleshy, cushion-like, with 5 short lobes. *Ovary* 1-celled; *style* short, grooved, stigma peltate. *Fruit* unknown. *M. bracteata* Scortechini MSS. (not of Clarke).

Perak: *Scortechini* 1971.

This much resembles a leaf specimen issued by Koorders and Valeton (No. 914) from Herb. Buitenzorg as *M. trichotoma*, Bl. I have not seen Blume's type of this species. But in his Bijdragen he describes its flowers as tetramerous. A Sumatra specimen collected by Beccari (P.S. 956) which has ripe fruit but no flowers probably belong to this. These fruits are narrowly oblong, tapering to each end, smooth, slightly over an inch in length and about ·35 in. in diam. (when dry). *M. Scortechinii* much resembles *M. bracteata*, Clarke; but differs in having bold acute calyx-teeth, and only one kind of bracts on the inflorescence.

3. Mastixia gracilis, King n. sp. A small tree; young branches slender, angled, smooth, yellowish. *Leaves* thinly coriaceous, lanceolate, tapering much to the base and still more to the much acuminate apex; both surfaces pale olivaceous-green when dry, glabrous; the upper shining, the lower somewhat dull; main-nerves 8 to 14 pairs, ascending, very little curved, faint on both surfaces; length 2·25 to 4·5 in.; breadth ·8 to 1·5 in.; petioles varying from ·2 to ·25 in. *Cymes* in threes, terminal, about a third or a fourth the length of the leaves, on short angled peduncles, the branches short and crowded at their apices, many-flowered, with a whorl of minute broad bracts at the base of flower pedicels. *Flowers* about ·1 in. long, their pedicels about as long, ovoid. *Calyx* campanulate; the tube puberulous, slightly furrowed; the mouth wavy, indistinctly 5-toothed. *Petals* 5, oblong-ovate, adherent by their edges, concave, leathery. *Stamens* 5; *anthers* oblong, bifid: filaments short. *Disc* small. *Style* short, conical: stigma concave. *Fruit* unknown.

Perak: at an elevation of about 5,000 feet; *Wray* 1528.

4. Mastixia Maingayi, Clarke in Hook. fil. Fl. Br. Ind. II, 746. A tall tree; young branches, petioles, under surfaces of leaves, branches and bracts of the inflorescence and the outer surfaces of the calyx and petals densely and softly rusty-tomentose. *Leaves* opposite, coriaceous, elliptic or elliptic-ovate, the apex shortly and abruptly acuminate, the base cuneate; upper surface glabrous, greenish when dry, the midrib and nerves impressed; the tomentum on the lower surface pale brown; main-nerves 6 to 8 pairs, ascending, curved, very prominent on the lower surface and connecting nerves transverse; length 4 to 6 in.; breadth 1·5 to 3 in.; petioles unequal, ·75 to 1 in. *Cymes* branched, on peduncles 1·5 to 2 in. long, terminal, longer than the leaves; the bracts at the bases of the branches small, oblong. *Flowers* numerous, ·15 in. long. *Calyx* campanulate, deeply 4-lobed; the lobes broadly ovate, obtuse. *Petals* 4, similar in shape to the sepals but smaller, concave, adnate by their edges. *Stamens* 4, inserted on a thick fleshy cushion-like circular disc by short filaments; *anthers* short, broadly ovate, cordate, introrse. *Ovary* one-celled, crowned by the fleshy disc. *Fruit* ellipsaid, not compressed, attenuate towards the apex, smooth, 1·2 in. long and ·6 in. in diam.

MALACCA: *Maingay* (K.D.) 711. SINGAPORE: *T. Anderson, Kurz.*

VAR. *sub-tomentosa*, King. The tomentum minute, the *panicles* somewhat shorter, otherwise as in the typical form. *M. Junghuhniana*, Clarke not of Miq. in Hook. fil. Fl. Br. Ind. II, 746.

SINGAPORE: *Ridley* 6293, 6340. PENANG: *Curtis* 1564. MALACCA: *Maingay* (K.D.) 709.

5. MASTIXIA CLARKEANA, King n. sp. A tree 40 to 60 feet high; young branches slender, striate, glabrous. *Leaves* opposite, thinly coriaceous, oblong or oblong-lanceolate, narrowed to the rounded or sub-acute base; the apex rather abruptly and somewhat bluntly acuminate; both surfaces glabrous, the upper pale olivaceous-green, the lower dull, pale brownish when dry; main-nerves 5 to 6 or 7 pairs, ascending, slightly curved, impressed on the upper surface, prominent on the lower; length 3 to 4 in.; breadth 1 to 1·35 in.; petiole ·3 to ·35 in. *Cymes* terminal, nearly as long as (or sometimes longer than) the leaves, pedunculate, with rather numerous many-flowered angular puberulous branches: bracteoles minute, opposite in pairs, lanceolate or ovate, concave. *Flowers* ·1 in. long, sessile. *Calyx* funnel-shaped, pubescent outside, the month with 4 deep broadly ovate teeth. *Corolla* depressed-globular in bud. *Petals* 4, nearly as long as the calyx-teeth, ovate-rotund, concave. *Stamens* 4: anthers short, ovate-rotund, filaments short. *Disc* fleshy, 4-lobed. *Style* short, compressed. *Stigma* concave. *Fruit* unknown.

PERAK: *Scortechini* 98, 625, 869; *King's Collector* 10861.

VAR. *macrophylla*, King. *Leaves* ovate-elliptic, shortly acuminate; main nerves 7 pairs: flowers as in the typical form.

PERAK: *Scortechini* 10575.

There are in Herb. Cal. specimens belonging to four distinct species of *Mastixia* which are too imperfect to be named, and which I have been unable to match with any already described species. These are as follows:—

(*a*). Two gatherings (*Wray* 1234 and *King's Collector* 2907) of a plant collected at an elevation of from 3000 to 3400 feet in Perak which is evidently a *Mastixia*. In their leaves these resemble *M. Maingayi*, Clarke, var. *sub-tomentosa*, King; but the under surfaces are more glabrous and the main-nerves are rather more oblique than in that plant; the young branches are moreover of a dark colour and almost glabrous, while those of *M. Maingayi* are pale and rufescently tomentose. These specimens are in fruit, and none of them has a single flower. The fruit is narrowly ellipsoid, attenuate gradually to the apex, smooth, 1·2 in. long, and ·4 in. in diam. While the leaves suggest a relationship to *M. Maingayi*, the remains of the calyx-lobes at the apex of the fruit, which are 4-lobed, suggest perhaps a still closer affinity to the tetramerous species *M. Clarkeana*, King.

(*b*). A specimen from Penang (Herb. *Curtis* 919) which is in fruit only.

(*c*). Specimens of a tetramerous species (in fruit only) from the Andamans with leaves otherwise like those of *M. pentandra*, Bl., but obscurely serrate.

(*d*). Two specimens collected by Mr. Wray at an elevation of 6,700 feet in Perak. These are in fruit; their leaves resemble those of *M. gracilis*, King, but have the main-nerves fewer but bolder.

2. Alangium, Lamk.

Shrubs or trees. *Leaves* alternate, petiolate, entire, persistent. *Flowers* in axillary fascicles or short cymes, hermaphrodite, hairy, jointed on their pedicels; bracts small or 0. *Calyx-tube* adnate to the ovary, the limb toothed or truncate. *Petals* 5 or 6 (rarely more), linear-oblong, valvate, sometimes becoming reflexed. *Stamens* equal in number to or twice as many as the petals or more; the anthers, long, linear; the filaments short compressed, often hairy. *Ovary* inferior, 1- to 3-celled, or 1-celled at the apex and 2- to 3-celled at the base, surmounted by a fleshy disc: *style* very long often clavate; *stigma* large, capitate or pyramidal; *ovule* pendulous. *Fruit* a berry, often with very scanty pulp, crowned by the slightly enlarged calyx. *Seed* oblong, compressed; albumen fleshy, sometimes ruminate; cotyledons leafy, flat or crumpled: radicle long or short.—Distrib. About 16 species, in tropical and sub-tropical Asia and Africa, Australia, Polynesia.

Stamens (in Malayan specimens) more than 6 (usually 15 to 20): fruit only slightly compressed	1. *A. Lamarckii.*
Stamens 5 or 6; fruit much compressed:—	
Leaves oblique, membranous:—	
Cymes on comparatively long peduncles, much-branched, many-flowered	2. *A. uniloculare.*
Leaves not oblique, coriaceous:—	
Cymes on short peduncles; flowers 6 to 12, shortly pedicelled and ·1 in. in diam.; leaves glabrous above and minutely scaly underneath ...	3. *A. ebenaceum.*
Cymes sessile, 3- to 5-flowered; flowers ·25 in. in diam.; leaves glabrous on both surfaces ...	4. *A. Ridleyi.*
Cymes on very short peduncles, 4- to 8-flowered: flowers ·1 in. in diam.; leaves tomentose or pubescent on lower surface	5. *A. nobile.*

1. Alangium Lamarckii, Thwaites Enum. Pl. Ceyl. 133. A shrub or small tree. *Leaves* variable in form and size, those of the Malayan specimens oblong-elliptic, elliptic to elliptic-ovate or ovate-rotund, the base rounded or slightly cordate, the apex with a short blunt apiculus; upper surface glabrous or nearly so, the lower with a few scattered hairs; main-nerves 4 or 5 pairs, reticulations distinct; length 3 to 6 in.; breadth 2 to 3·5 in; petiole ·2 to ·3 in. *Flowers* in short dense fascicles of 4 to 8, about ·75 in. long; peduncles, pedicels and outside of calyx rusty-tomentose. *Calyx* cupular, slightly 6-toothed. *Petals* lanceolate,

sub-acute, externally hairy, inside glabrous but with a hairy mesial line. *Stamens* about 18, two opposite each petal and one opposite each sepal, free; filaments slender pilose; *anthers* linear reaching almost to the apices of the petals. *Disc* annular, wavy. *Style* as long as the stamens, 6-grooved; stigma 3-lobed. *Fruit* ellipsoid, slightly compressed, contracted below the disc-bearing mouth, densely and minutely tomentose, ·75 to 1 in. long and ·65 in. in diam. Dalz. & Gibs. Fl. Bombay 109; Brandis For. Fl. N.-W. India 250; Clarke in Hook. fil. Fl. Br. Ind. II, 741; Trimen Fl. Ceylon I, 285. *A. decapetalum*, Lamk. Dict. I, t. 174; DC. Prodr. III, 203; Wall. Cat. 6884; W. & A. Prodr. 325; Wight Ic. t 194 Miq. Fl. Ind. Bat. I, Pt. I, 774; Kurz For. Fl. I, 543. *A. hexapetalum*, Lamk. and DC. ll. c.; Roxb. Hort. Beng. 38, Fl. Ind. II, 502; Wall. Cat. 6883; W. & A. Prodr. 326; Wight Ill. t. 96. *A. sundanum*, Miq. Fl. Ind. Bat. I, Pt. I, 774; Kurz. l.c. *A. tomentosum*, Lamk. and DC. ll. c.; Wall. Cat. 6885. *A. latifolium*, Miq. in Pl. Hohenack. No. 719.—Rheede Hort. Mal. IV, tt. 17, 26.

Perak: *Scortechini; King's Collector* 5590. Singapore; *Ridley* 6020.—Distrib. Brit. India, Malayan Archipelago, S. China, Philippines, East Africa.

Var. *glandulosa*, Clarke in Hook. fil. Fl. Br. Ind. II, 742. A large climber. *A. glandulosa*, Thw. Enum. Pl. Ceyl. 133; Trimen Fl. Ceyl. II, 286.

Andaman and Nicobar Islands. Distrib. Ceylon.

2. Alangium uniloculare, King. A tree 30 to 60 feet high; young branches minutely rusty-pubescent, slender. *Leaves* membranous, obliquely ovate-lanceolate or oblong-lanceolate, acuminate, the base unequal, one side rounded the other acute, the edges somewhat wavy; upper surface glabrous except the tomentose midrib and pubescent main-nerves; the lower sparsely sub-adpressed pubescent and minutely glandular; main-nerves 4 to 6 pairs, ascending, the lower on one side much branched, all slightly prominent on both surfaces; the main-veins sub-parallel; length 3·5 to 5·5 in.; breadth 1·75 to 2·25 in.; petiole ·25 to ·3 in., villous. *Cymes* axillary, about one-third of the length of the leaves, pedunculate; the branches spreading, rusty pubescent, many-flowered. *Flowers* about ·4 in. long, with subulate bracteoles and short pedicels. *Calyx-tube* funnel-shaped, not grooved, the mouth minutely toothed. *Petals* 5, linear; *anthers* linear; filaments short, broad, woolly at the apex. *Style* cylindric, pubescent; stigma subglobose. *Fruit* ovate in outline, much tapered to the apex, compressed, faintly ridged when dry, ·6 in. long and ·35 in. broad when dry. *Marlea unilocularis*, Griff. Notul. IV, 679. *M. Griffithii*, Clarke in Hook. fil. Fl. Br. Ind. II, 742.

Malacca: *Griffith* (K.D.) 3387; *Maingay* 708. Perak: *Wray* 2927, 3486; *Scortechini* 1914; *King's Collector*—many numbers.

3. Alanguim ebenaceum, Griffith MSS. A tree 30 to 70 feet high; young branches rather slender, smooth, dark-coloured when dry. *Leaves* coriaceous, oblong, slightly acuminate, the base cuneate or rounded; upper surface glabrous, the lower with numerous minute pale scales; main-nerves 13 to 16 pairs, spreading, very slightly curved, prominent on the lower surface; length 6 to 10 in.; breadth 2·5 to 4 in.; petiole ·35 to ·8 in. long. *Cymes* from as long to twice as long as the petioles, on short peduncles, axillary, branched, 6- to 12-flowered. *Flowers* sessile, ·65 in. long, and only ·1 in. in diam. *Calyx* cupular slightly grooved; the mouth truncate, slightly toothed. *Petals* 6 (sometimes only 5), linear, minutely pubescent externally. *Stamens* 6 (or 5); *anthers* about as long as the petals, linear; filaments short, compressed, woolly in front. *Style* cylindric-clavate, shortly hairy; stigma pyramidal. *Fruit* ovate in outline, compressed, faintly ridged, about 1 in. long and ·6 in. wide. *Marlea ebenacea*, Clarke in Hook. fil. Fl. Br. Ind. I, 742.

Malacca: *Griffith* (K.D.) 3384. *Maingay* (K.D.) 706. Perak: *Wray* 3302; *Scortechini* 1963; *King's Collector* 3252, 5363, 6562, 6626.

4. Alangium Ridleyi, King. A tree; young branches covered with minute deciduous scales and hairs, rather slender. *Leaves* coriaceous, elliptic, sometimes slightly obovate, shortly and bluntly acuminate, the base cuneate; both surfaces glabrous; main-nerves 10 pairs spreading, slightly curved upwards, bold and prominent on the lower surface; connecting veins parallel, faint; length 6 to 8 in.; breadth 2·5 to 3·5 in.; petioles ·9 to 1·3 in. *Cymes* as long as or rather shorter than the petioles, sessile, 3- to 5-flowered. *Flowers* nearly 1 in. long, ·25 in. in diam. their pedicels ·2 to ·25 in. long, minutely velvety-tomentose like the outside of the calyx and petals. *Calyx* campanulate, slightly furrowed, the mouth wide truncate. *Petals* 6, thick, grooved and minutely hairy inside, oblong-lanceolate, sub-acute. *Stamens* somewhat shorter than the petals; *anthers* narrowly linear, with a tuft of hairs at the base; filaments short flat almost glabrous. *Style* slender clavate; stigma deeply furrowed, disc 6-angled cushion-like, glabrous. *Fruit* unknown.

Singapore, in the Botanic Garden Jungle, *Ridley* 4941.

Ridley's specimens are without fruit. Mr. Wray has sent from Perak some specimens (Herb. *Wray* 3632) of a plant in fruit which in spite of its considerably larger leaves (nearly a foot long), may be conspecific with this. These fruits are narrowly ellipsoid, much compressed and deeply furrowed, narrowly to the base, less so to the truncate apex. *A. costata*, Boerl. MSS. is the nearest ally of both.

5. Alangium nobile, Harms. A tree 60 to 100 feet high : young branches and petioles velvety rusty-tomentose. *Leaves* coriaceous, elliptic to ovate-elliptic, rarely slightly obovate, entire, the base slightly cordate rarely sub-acute, the apex blunt or very shortly and bluntly acuminate; upper surface almost glabrous, the midrib and nerves minutely tomentose: lower surface densely and minutely tomentose or pubescent; main-nerves 8 to 10 pairs, spreading, slightly curved, very bold on the lower surface when dry, the secondary nerves transverse and bold; length 4·5 to 12 in.; breadth 3 to 6·5 in.; petiole ·8 to 1·75 in. *Cymes* on very short peduncles, 4- to 8-flowered, shorter or slightly longer than the petioles. *Flowers* ·5 or ·6 in. long and ·1 in. in diam.; their pedicels very short and thick. *Calyx* narrowly campanulate; deeply 6-grooved; the mouth with 6 deep lanceolate spreading teeth. *Petals* thick, narrowly oblong, sub-acute, tomentose, especially outside, sub-glabrous inside. *Stamens* 6, shorter than the petals, filaments short villous inside; *anthers* linear. *Style* cylindric, adpressed villous; stigmas linear. *Disc* glabrous, deeply 6-lobed. *Fruit* compressed, ridged, ellipsoid in outline, slightly contracted at both ends, tomentose, about 1 in. long and ·65 in. broad. *Marlea nobilis*, Clarke in Hook. fil. Fl. Br. Ind. II, 743.

Malacca: *Griffith* (K.D.) 3384, 3385. *Maingay* (K.D.); 705, 707. Perak: *King's Collector* 6047, 6116, 10892. Singapore: *Maingay*; *Ridley* 5077.

Beccari collected in Borneo specimens (Herb. Becc. P.B. 3611) of a species closely allied to this, the flowers of which are however longer (·85 in.) with the calyx-tube much less prominently grooved.

3. Nyssa, Linn.

Trees (or shrubs), innovations silky. *Leaves* alternate, petioled, entire. *Flowers* capitate, on axillary peduncles, polygamo-dicœcious, 1 or few females and many males in a head, each 3–4-bracteolate, or the males irregularly coalescing. Male: calyx short, cup-shaped, 5-7-toothed; petals 5-7, imbricate, hairy; stamens usually 10 (in the Indian species) around a large circular disc; rudiment of the ovary 0 or small. Female: calyx-tube campanulate; limb 5-toothed; petals 0 or minute; rudimentary stamens none; ovary 1-celled; style cylindric, simple or shortly 2-fid; ovule solitary, pendulous. *Berry* oblong or ovoid. *Albumen* copious; cotyledons flat, leafy, nearly as broad as the seeds.—Distrib. Species 5-6, in N. America, and from Sikkim to Java.

Nyssa sessiliflora, Hook. fil. in Gen. Plantar. I, 952. A tree. *Leaves* sub-coriaceous, oblanceolate or elliptic-lanceolate tapering to each end, length 4 to 8 in.; breadth 1·5 to 2·5 in.; petiole ·6 to ·8 in.; both surfaces minutely punctate; main-nerves 6 to 8 pairs, spreading.

Peduncles puberulous, ·5 to 1 in. long. *Ripe fruit* oblong-ovoid, smooth, crowned by the small circular calyx, ·6 to ·75 in. long when dry. Clarke in Hook. fil. Fl. Br. Ind. II, 747. *Daphniphyllopsis capitata*, Kurz For. Fl. I, 240; and in Journ. As. Soc. 1875, Pt. II, 201, with fig. *Ilex daphniphylloides*, Kurz in Journ. As. Soc. 1870, Pt. II, 72. *Agathisanthes javanica*, Blume Bijd. 645; Miq. Fl. Ind. Bat. I. Pt. I. 839. *Ceratostachya arborea*, Blume Bijd. 644; Miq. l.c.

Perak: at elevat. of 3,400 feet, *Wray*.—Distrib. Sumatra, *Forbes* 2880: *Beccari* (P.S.) 17, 335; Java; Trop. Eastern Himalaya; Khasia Hills.

INDEX.

The figures given in this index are those of the *lower outer* corners of the pages of the text.

Abaumia excelsa, Becc., 167
ABRUS, Linn., 34
,, *acutifolius*, Blume MSS., 35
,, laevigatus, *E. Mey*, 35
,, *melanospermus*, Hassk., 35
,, *minor*, Desv., 34
,, precatorius, *Linn.*, 34
,, pulchellus, *Wall.*, 35
,, *pauciflorus*, Desv., 34
ACACIEAE, 30
ACACIA, Willd., 65
,, *arrophula*, Don, 250
,, *biceps*, Willd., 246
,, caesia, *W. & A.*, 249
,, *elata*, Grah., 260
,, Farnesiana, *Willd.*, 248
,, *foliolosa*, Grah., 255
,, *frondosa*, Willd., 246
,, *glauca*, Willd., 246
,, *graveolens*, Jack, 241
,, *indica*, Desv., 249
,, *Koeringa*, Royle, 266
,, *Lebbek*, Willd., 258
,, *leucocephala*, Link, 246
,, *lomatocarpa*, DC., 259
,, *marginata*, Ham., 256
,, *myriophylla*, Grah., 255
,, *odoratissima*, Willd., 259
,, pennata, *Willd.*, 250
,, ,, var. pleuricapitata, *Bak.*, 250
,, ,, var. arrophula, *Bak.*, 250
,, *pluricapitata*, Steud., 250
,, *polycephala*, Grah., 250
,, *procera*, Willd., 260
,, pruinescens, *Kurz*, 249
,, pseudo—Intsia, *Miq.*, 249
,, ,, var. ambigua, *Prain*, 249
,, ,, var. typica, 249
,, *Sirissa*, Ham., 258
,, *Smithiana*, Wall., 256
,, *speciosa*, Willd., 258
,, *stipulata*, DC., 256
Acmena parviflora, DC., 5, 39
,, *zeylanica*, Thw., 539
Adamia chinensis, Gardn. et Champ., 298
,, *cyanea*, Wall., 298
,, *versicolor*, Forst., 298
ADENANTHEREAE, 30
ADENANTHERA, Linn., 242
,, bicolor, *Moon*, 243
ADENANTHERA borneensis, *Brace*, 244
,, pavonina, *Linn.*, 243
ADENIA, Forsk, 579
,, acuminata, *King*, 583
,, cardiophylla, *Engl.*, 581
,, nicobarica, *King*, 580
,, populifolia, *Engl.*, 582
,, Singaporeana, *Engl.*, 583
,, trilobata, *Engl.*, 580
Aechmandra Blumeana, Roem., 383
,, *indica*, Ann., 383
AESCHYNOMENE, Linn., 127
,, aspera, *Linn.*, 128
,, *aspera*, Wall., 128
,, *cannabina*, Retz, 83
,, *diffusa*, Willd., 128
,, indica, Linn., 128
,, *indica*, var. *aspera*, Hassk., 129
,, *paludosa*, Roxb., 83
,, *pumila*, Linn., 128
,, *Roxburghii*, Spr., 128
,, *trachyloba*, Miq., 129
,, *uliginosa*, Roxb., 83
,, viscidula, Willd., 128
AFZELIA, Smith, 207
,, *Bakeri*, Prain MSS., 209
,, bijuga, *A. Gray*, 208
,, *bijuga*, Kurz, 209
,, palembanica, *Baker*, 209
,, retusa, *Kurz*, 207
Agalma redivivum, Seem., 395
Aganope floribunda, Miq., 100
Agasta Asiatica, Miers, 565
,, *indica*, Miers, 565
,, *splendida*, Miers, 565
Agati grandiflora, Desv., 84
AGELAEA, Soland., 17
,, Diepenhorstii, *King*, 20
,, Hullettii, *King*, 19
,, pinnata, *King*, 18
,, vestita, *Hook. fil.*, 17
,, Wallichii, *Hook. fil.*, 18
Agisanthes javanica, Bl., 608
Akar—Katop—katop, 192
Aker—pakidah, 106
Aker tapak—Kuda—merah, 192
Aker—tuba—tuba, 106
Aker—tuba, 107
ALANGIUM, Lam., 604
,, costatum, *Boerl. MSS.*, 606

ALANGIUM, *decapetalum*, Lam., 605
,, ebenaceum, *Griff.*, 606
,, *glandulosum*, Thw., 605
,, *hexapetalum*, Lam., 605
,, *latifolium*, Miq., 605
,, Lamarckii, *Thw.*, 604
,, ,, var. glandulosa, *Clarke*, 605
,, nobile, *Harms*, 607
,, Ridleyi, *King*, 606
,, *sundanum*, Miq., 605
,, *tomentosum*, Lam., 605
,, uniloculare, *King*, 605
ALBIZZIA, Durazz., 254
,, *bubalina*, Kurz, 267
,, *latifolia*, Boiv., 258
,, Lebbek, *Benth.*, 257
,, littoralis, *Teysm. and Binn.*, 257
,, *fasciculata*, Kurz, 270
,, lucida, *Benth.*, 260
,, *micrantha*, Boiv., 259
,, myriophylla, *Benth.*, 254
,, odoratissima, *Benth.*, 259
,, pedicellata, *Baker*, 258
,, procera, *Benth.*, 259
,, *splendens*, Miq., 264
,, stipulata, *Boiv.*, 255
,, ,, var. *stipulis persistentibus*, Miq., 256
,, ,, var. *typica*, Miq., 256
,, ,, var. *vegeta*, Miq., 256
,, *umbrosa*, Benth., 253
ALLOMORPHIA, Blume, 418
,, alata, *Scort.* MSS., 420
,, exigua, *Bl.*, 418
,, ,, var. minor, *King*, 419
,, Wrayi, *King*, 419
,, *Griffithii*, Hook., 453
Almond, East Indian, 332
ALISICARPUS, Neck., 132
,, *diversifolius*, Wall., 133
,, *Harnieri*, Schw., 133
,, *nummularifolius*, DC., 133
,, vaginalis, DC., 132
,, ,, var. nummularifolia, *Miq.*, 133
,, ,, var. typica, *Prain*, 133
,, *varius*, Wall., 133
ALSOMITRA, Bth. & Hook. fil., 386
,, *cissoides*, Roem., 384
,, clavigera, *Roem.*, 386
,, *laxa*, Roem., 384
Amaltas, 157
Ameletia acutidens, Miq., 347
,, *elongata*, Bl., 347
,, *indica*, DC., 347
,, *latifolia*, Wall., 347
,, *polystachya*, Wall., 347
Amerimnum obovatum, Wall., 100
AMHERSTIEAE, 29
AMMANNIA, Linn., 346
,, baccifera, *Linn.*, 347
,, *debilis*, Ait., 348
,, *indica*, Lamk., 348
,, *nana*, Roxb., 347
,, peploides, *Spreng.*, 347
,, repens, Rottl., 347
,, *verticillata*, Boiss, 348
,, *vesicatoria*, Roxb., 347
ANERINCLEISTUS, Korth., 423
,, Curtisii, *Stapf*, 425
,, floribundus, *King*, 425
,, glomeratus, *King*, 426
,, macranthus, *King*, 423
,, Scortechinii, *King*, 424
,, sublepidotus, *King*, 425
Anictoclea Grahamiana, Nimmo, 575
ANISOPHYLLEA, Br., 322
,, apetala, *Scort.*, 323
,, Curtisii, *King*, 326
,, disticha, *Baill.*, 322
,, Gaudichaudiana, *Baill.*, 324
,, *grandiflora*, Hensl., 324
,, Griffithii, *Oliv.*, 325
,, laurina, Sab., 323
,, rhomboidea, *Baill.*, 326
,, Scortechinii, *King*, 325
,, *trapezoidalis*, Baill., 323
Anisophyllum flavicans, Hook. fil. & Thoms., 324
,, *grande*, Benth., 324
,, *laurinum*, Don, 323
,, *trapezoidale*, Baill., 323
ANPLECTRUM, A. Gray, 464
,, anomalum, *King & Stapf*, 466
,, *cyanocarpum*, Kurz, 465
,, divaricatum, Triana, 466
,, *glaucum*, Triana, 465
,, lepidoto-setosum, *King*, 464
,, pallens, *Blume*, 465
Arachis hypogaea, *Linn.*, 125
ARALIACEAE, 386
ARALIA, Linn., 387
,, armata, *Seem.*, 388
,, *digitata*, Roxb., 396
,, *dubia*, Spreng., 402
,, ferox, *Miq.*, 389
,, Thomsoni, *Seem.*, 388
ARALIDIUM, Miq., 389
,, pinnatifidum, *Miq.*, 389
Araliopsis andamanica, Kurz, 406
Arnoldia pinnata, Bl., 299
ARTHROPHYLLUM, Blume, 403
,, *Blumeanum*, Zoll. et Mor., 403
,, diversifolium, *Bl.*, 403
,, *ellipticum*, Bl., 403
,, *javanicum*, Bl., 403
,, *ovalifolium*, Jungh. et De Vriese, 403

ARTHROPHYLLUM, pinnatum, Clarke, 403
Arthrosprion stipulatum, Hassk., 256
ASTRONIEAE, 411
ASTRONIA, Blume, 474
,, smilacifolia, *Triana*, 475
,, ,, var. lepidophylla, *Scort.*, 475
ATYLOSIA, W. & A., 45
,, crassa, *Prain*, 45
,, *glandulosa*, Dalz., 46
,, *mollis*, Benth., 46
,, scarabaeoides, *Benth.*, 46
Aubletia caseolaris, Gaertn., 355
Badamia Commersoni, Gaertn., 332
BAECKIA, Linn., 498
,, *Chinensis*, Gaertn.. 498
,, *Cumingiana*, Schauer, 498
,, frutescens, *Linn* , 498
,, Sumatrana, Bl., 498
BARRINGTONIA, Forst., 564
,, acutangula, *Gaertn.*, 570
,, *alata*, Wall., 566
,, *alba*, Miq., 567
,, *asiatica*, Kurz, 565
,, augusta, *Kurz*, 569
,, conoidea, *Griff.*, 566
,, *cylindrostachya*, *Griff.*, 568
,, fusiformis, King, 570
,, *macrophylla*, Miq., 565
,, macrostachya, *Kurz*, 567
,, musiformis, *King*, 569
,, pauciflora, *King*, 567
,, *pendula*, Kurz, 568
,, pterocarpa, *Kurz.*, 569
,, racemosa, *Roxb.*, 566
,, *sarcostachys*, Miq., 568
,, *speciosa*, Forst., 565
,, *speciosa*, Wall., 567
,, Scortechinii, *King*, 568
,, spicata, *Bl.*, 571
,, sumatrana, *Miq.*, 569
Baryxylum rufum, Lour., 208
Batai, 225
BAUHINIEAE, 28
BAUHINEA, Linn., 175
,, acuminata, *Linn.*, 179
,, albo-lutea, *Prain*, 181
,, *anguina*, Kurz, 193
,, anguina, *Roxb.*, 194
,, ,, var. Horsfieldii, *Watt MSS.*, 194
,, bidentata, *Jack*, 187
,, *Buchanani*, Desv., 178
,, *candida*, Ait., 179
,, *Championi*, Benth., 195
,, *cordifolia*, Roxb., 191
,, cornifolia, *Baker*, 186
,, coromandeliana, *DC.*, 180
,, corymbosa, 186
,, Curtisii, *Prain*, 195
,, diphylla, *Ham.*, 178
,, *diptera*, Blume, 193
BAUHINEA, *elongata*, Korth., 181
,, emarginata, Bak., 188
,, *emarginata*, Jack, 188
,, *emarginata*, *Mill*, 188
,, *ferruginea*, Korth., 185
,, ferruginea, *Roxb.*, 184
,, ferruginea, Roxb., var. *excelsa*, Bak., 183
,, ,, var. *Griffithiana*, Bak., 184
,, *ferruginea*, Kurz, 182
,, Finlaysoniana, *Grah.*, 190
,, glabrifolia, *Baker*, 193
,, glauca, *Wall.*, 186
,, Griffithiana, *Prain*, 183
,, Hullettii, *Prain*, 183
,, integrifolia, *Roxb.*, 191
,, Kingii, *Prain*, 189
,, Kochiana, *Korth*, 190
,, lucida, *Wall.*, 188
,, mollissima, *Wall.*, 180, 183
,, Pottsii, *G. Don*, 181
,, *piperifolia*, Kurz, 193
,, *purpurea*, Wall., 179
,, purpurea, *Linn.*, 180
,, *purpurea*, Zoll. et Mor., 181
,, Ridleyi, *Prain*, 185
,, *scandens*, Linn., 194
,, Scortechinii, *Prain*, 188
,, semibifida, *Roxb.*, 182
,, *speciosa*, Roxb., 179
,, strychnoidea, *Prain*, 195
,, *stipularis*, Korth., 182
,, tenuiflora, 186
,, tomentosa, *Linn.*, 178
,, *triandra*, Roxb., 180
,, Wrayi, *Prain*, 191
BEGONIACEAE, 584
BEGONIA, Linn., 585
,, andamensis, *Parish*, 588
,, borneensis, 593
,, bombycina, *Bl.*, 587
,, coespitosa, *Miq.*, 590
,, *coriacea*, Hassk., 590
,, debilis, *King*, 588
,, *elongata*, Wall., 588
,, Forbesii, *King*, 586
,, guttata, *Wall.*, 589
,, *guttata*, Wall., 588
,, Hasskarlii, *Zoll. et Mor.*, 590
,, *hernandifolia*, Hook., 590
,, Herveyana, *King*, 591
,, isoptera, *Dry.*, 586
,, isopteroidea, *King*, 587
,, Kunstleriana, *King*, 591
,, Lowiana, *King*, 595
,, Maxwelliana, *King*, 594
,, megapteroidea, *King*, 593
,, paupercula, *King*, 592
,, *peltata*, Hassk , 590
,, Perakensis, *King*, 592
,, praeclara, *King*, 594
,, *repanda*, Bl., 587

BEGONIA, Scortechinii, *King*, 590
,, sinuata, *Wall.*, 587
,, *subrotunda*, Wall., 588
,, Thaipingensis, *King*, 589
,, Thomsoni, *DC.*, 596
,, varians, *A. DC.*, 589
,, venusta, *King*, 593
,, *Wrayi*, Hemsl., 587
Benincasa *cerifera*, Savi, 379
,, hispida, Cogn., 378
Biancaea Sappan, Tod., 229
,, *scandens*, Tod., 229
Black Siris, 259
Blackwellia caryophyllacea, Zoll. et Mor., 366
,, *dasyantha*, Turcz., 366
,, *longiflora*, Miq., 366
,, *macrostachya*, Turcz., 364
,, *propinqua*, Wall., 365
,, *spiralis*, Wall., 365
BLASTUS, Lour., 420
,, Cogniauxii, *Stapf*, 421
Brachypterum, 100
Brachypterum scandens, Benth., 101
,, *timorense*, Benth., 101
,, *floribundum*, Miq., 105
Bradburya, Raf., 57
BRASSIOPSIS *confluens*, Seem., 402
,, Hainla, *Seem.*, 406
,, palmata, *Kurz*, 405
,, ,, var. andamanica, 406
BRUGUIERA, Lamk., 313
,, caryophylloides, *Bl.*, 315
,, *cylindrica*, *W. & A.*, 316
,, *madagascariensis*, DC., 335
,, eriopetala, *W. & A.*, 314
,, gymnorhiza, *Lamk.*, 314
,, *parietosa*, Griff., 315
,, parviflora, *W. & A.*, 315
,, *parviflora*, Wall., 315
,, *Rheedii*, Miq., 314
,, *Rumphii*, Bl., 315
Bryonia Blumei, Ser., 383
,, *cheirophylla*, Wall., 378
,, *Cochin-chinensis*, Lour., 376
,, *epigaea*, Bl., 383
,, *geminata*, Bl., 383
,, *grandis*, Wall., 376
,, *heterophylla*, Bl., 383
,, *marginata*, Bl., 383
,, *palmata*, Wall., 373
,, *tenella*, Roxb., 383
,, *umbellata*, Wall., 371
Bua jiring, 266
,, *Karbau*, 265
Bucklandia populnea, *R. Br.*, 308
,, *populifolia*, Hf. & T., 308
Bunah Saga, 244
Bunga Talan, 213
Butea parviflora, Roxb., 75
,, *sericophylla*, Wall., 75
,, *gyrocarpa*, Wall., 76
Butea acuminata, Wall., 78
Butonica Rumph, 565
,, *alata*, Miers, 566
,, *alba*, Miers, 567
,, *inclyta*, Miers, 567
,, *racemosa*, Miers, 567
,, *rubra*, Miers, 567
Cacoucia lucida, Hassk., 336
,, *trifoliata*, DC., 336
Caesalpinaria, *Bth. & H. f.*, 228
CAESALPINEAE, 152
CAESALPINEA, Linn., 225
,, acanthobotrya, *Miq.*, 232
,, *arborea*, Zoll., 224
,, *bijuga*, Wall., 227
,, Bonduc, *Roxb.*, 226
,, Bonducella, *Flem.*, 226
,, cinclidocarpa, *Miq.*, 230
,, *crista*, *Thunb.*, 229
,, *dasyrachis*, Miq., 225
,, digyna, *Rottl.*, 231
,, *ferox*, Hassk., 229
,, *ferruginea*, Dcne, 224
,, *Finlaysoniana*, Grah., 225
,, *flavicans*, Grah., 231
,, *gracilis*, Miq., 231
,, hymenocarpa, Wall., 233
,, *inermis*, Roxb., 224
,, *japonica*, Sieb. & Zucc., 229
,, Nuga, Ait., 227
,, *oleosperma*, Roxb., 231
,, *paniculata*, Desf., 227
,, parviflora, *Prain*, 230
,, ,, var. ? stipularis, 230
,, ,, var. typica, 230
,, pulcherrima, *Sw.*, 228
,, Sappan, *Linn.*, 228
,, *scandens*, Koen, 227
,, sepiaria, *Roxb.*, 229
,, *sumatrana*, Roxb., 235
,, *sumatrana*, Wall. 227
,, tortuosa, *Roxb.*, 231
CAJANEAE, 24
CAJANUS, DC., 46
,, *bicolor*, DC., 47
,, *flavus*, DC., 47
,, *glandulosus*, Dalz. & Gibs., 46
,, indicus, *Spreng.*, 47
,, *scarabaeoides*, Thouars, 46
Caju gadelupa, Rumph., 95, 96, 207
Caju Lacca, 123
Calliandra Saman, Griseb., 252
Calliandra umbrosa, *Benth.*, 253
Calycopteris floribunda, *Lamk.*, 333
,, *nutans*, Kurz, 333
Calyptranthes capitellata, Ham., 561
,, *costata*, Ham., 560
,, *cuneata*, Ham., 560
,, *fastigiata*, Bl., 543
,, *grandis*, Ham., 560
,, *Jambolana*, Willd., 561
,, *mangiferifolia*, Hance, 560

Calyptranthes pyrifolia, Bl., 529
,, *Tatna*, Ham., 560
CANAVALIA, DC., 62
,, ensiformis, DC., 62
,, ,, var. *turgida*, Bak., 64
,, *gladiata*, DC., 62
,, lineata, *DC.*, 63
,, obtusifolia, *DC.*, 63
,, *obtusifolia*, Bak., 63
,, *turgida*, Grah., 64
Cantherospermum pauciflorum, W. & A., 46
CARALLIA, Roxb., 318
,, *ceylanica*, Arn., 319
,, *corymbosa*, Arn., 319
,, cuspidata, Bl., 319
,, eugenioidea, *King*, 320
,, *integerrima*, DC., 318
,, lancaefolia, *Roxb.*, 319
,, lucida, *Roxb.*, 318
,, *octopetala*, Mull., 319
,, Scortechinii, *King*, 319
,, *sinensis*, Arn., 319
,, *symmetria*, Bl., 319
,, *timorensis*, Bl., 319
Carandje, Bont., 170
Careya macrostachya, Jack, 568
,, *pendula*, Griff, 568
Carpopogon anguineum, Roxb., 66
,, *giganteum*, Roxb., 68
,, *imbricatum*, Roxb., 65
,, *monospermum*, Roxb., 66
,, *pruriens*, Roxb., 69
CASEARIA, Jacq., 358
,, *acuminata*, Wall., 322
,, albicans, *Wall.*, 360
,, *albicans*, Clarke, 362
,, andamanica, *King*, 360
,, *Championii*, Thw., 361
,, *cinerea*, Turcz., 360
,, Clarkei, *King*, 362
,, esculenta, *Roxb.*, 361
,, grewiaefolia, *Vent.*, 360
,, Kunstleri, *King*, 361
,, Lobbiana, *Turcz.*, 359
,, macrocarpa, *Clarke*, 362
,, *subcuneata*, Miq , 360
,, *variabilis*, Bl., 360
,, *Zeylanica*, Thw., 361
,, *laevigata*, Dalz., 361
CASSIA, Linn., 153
,, alata, *Linn.*, 161
,, *angustissima*, Lamk., 165
,, *arborescens*, Vahl, 158
,, *Bacillus*, Gaertn, 156
,, *bracteata*, Linn. f., 162
,, *Chinensis*, Jacq., 161
,, *coromandeliana*, Jacq., 161
,, *esculenta*, Roxb., 161
,, Fistula, *Linn.*, 156
,, *florida*, Vahl, 164
,, *foetida*, Salisb., 158
CASSIA, *foetida*, Pers., 161
,, *frutescens*, Mill., 161
,, *gallinaria*, Collad., 158
,, *glauca*, Lamk., 157
,, *herpetica*, Jacq., 162
,, hirsuta, Linn., 159
,, *humilis*, Collad., 158
,, javanica, Linn., 156
,, Leschenaultiana, *DC.*, 165
,, mimosoides, *Linn.*, 164
,, ,, var. *Wallichiana*, Bak., 165
,, nodosa, *Ham.*, 155
,, obtusifolia, *Linn.*, 159
,, ,, var. β *Miq.*, 159
,, occidentalis, *Linn.*, 160
,, *palmata*, Wall., 163
,, *rhombifolia*, Roxb., 157
,, *sensitiva*, Roxb., 165
,, siamea, *Lamk.*, 163
,, Sophera, *Linn.*, 161
,, *Sophera*, Wall., 161
,, *sumatrana*, Roxb., 164
,, *suraltensis*, Burm., 158
,, *Tagera*, Lamk, 158
,, *tenella*, Roxb., 165
,, timoriensis, *DC.*, 162
,, ,, var. typica, 163
,, ,, var. xanthocoma, *Miq.*, 163
,, ,, var. *chrysocoma*, Koord. & Val, 163
,, *tomentosa*, Wall., 160
,, Tora, *Linn.*, 158
,, ,, var. β *L.*, 159
,, ,, var. β *W. & A.*, 159
,, *Tora*, Baker, 159
,, *toroides*, Roxb., 159
,, *xanthocoma*, Miq., 163
,, *Wallichiana*, DC., 165
CASSIEAE, 28
Catappa domestica, Rumph., 332
,, *litorea*, Rumph., 332
,, *sylvestris*, Rumph., 332
Centrosema Plumieri, *Benth.*, 57
,, virginianum, 57
Cerasiocarpum ? Maingayi, Clarke, 383
,, *penangense*, Clarke, 383
Ceratostachya arborea, Bl., 608
Ceriops Candolleana, *Arn* , 317
,, Roxburghiana, *Arn.*, 316
Cinclidocarpus, *Baker*, 231
Citta, 65
Citta nigricans, Lour., 65
Chaenolobium septemjugum, Miq., 151
Chamaecrista, *DC.*, 164
Chrysobalaneae, 275
Clavulium pedunculosum, Desv., 41
Clavimyrtus lineatus, Bl., 530
,, *virens*, Bl., 535
CLITOREA, Linn., 56
,, cajanifolia, *Benth.*, 57

CLITOREA, *fluminensis*, Vell., 58
,, Ternatea, *Linn.*, 56
,, *Plumieri*, Juss., 58
Clypearia rubra, Rumph, 274
CNESTIS, Juss., 20
,, *acuminata*, Wall., 12
,, foliosus, *Planch. MSS.*, 21
,, *flaminea*, Griff., 21
,, *monodelpha*, Roxb., 13
,, *mimosoides*, Jack., 15
,, *igneus*, Planch. MSS., 21
,, *platantha*, Griff., 21
,, ramiflora, *Griff.*, 21
,, *vestita*, Wall., 17
Cacara erosa, Kuntze, 54
Cocculus ? flavicans, Wall., 324
Codariocalyx conicus, Hassk., 145
,, *gyrioides*, Hassk., 145
Collaea mollis, Grah., 46
COMBRETACEAE, 326
COMBRETUM, Linn., 335
,, Chinense, *Roxb.*, 338
,, ,, var. Porterianum, 338
,, ,, var. pubescens, 339
,, ,, var. ternatum, 338
,, *elegans*, Wall., 336
,, extensum, *Roxb.*, 337
,, *formosum*, Griff., 338
,, *Griffithii*, Heurck, 338
,, *Horsfeldii*, Miq., 338
,, Kunstleri, *King*, 340
,, *latifolium*, Bl., 338
,, *leucanthum*, Heurck, 338
,, *lepidotum*, Presl, 339
,, *lucidum*, Bl., 336
,, *macrostachyum*, Wall., 338
,, *maluloea*, Wall., 339
,, nigrescens, *King*, 340
,, *platyphyllum*, Heurck., 338
,, *Porteriana*, Wall. MSS., 338
,, *rotundifolium*, Roxb., 338
,, Scortechinii, *King*, 341
,, squamosum, *Roxb.*, 339
,, *subalternans*, Wall., 336
,, *sundiacum*, *Miq.*, 337
,, *ternatum*, Wall., 338
,, tetralophum, *Clarke*, 336
,, trifoliatum, *Vent.*, 336
,, *undulatum*, Wall., 336
,, *Wightianum*, Wall., 338
,, Wrayi, *King*, 339
CONNARACEAE, 1
CONNARUS, *Linn.* 2
,, ellipticus, *King*, 7
,, ferrugineus, *Jack*, 3
,, *floribundus*, Wall., 5
,, *foliosus*, Jack, 21
,, *fulgens*, Wall., 15
,, gibbosus, *Wall.*, 5, 6
,, grandis, *Jack*, 7
,, hebephyllus, *King*, 5
,, Maingayi, *Hook. fil.*, 3
CONNARUS, *mimusoides*, Vahl, 14, 15
,, Nicobaricus, *King*, 6
,, oligophyllus, *Wall.*, 5, 3
,, *rugosus*, Wall., 14
,, semidecandrus, *Jack*, 4, 7
,, *similis*, Bl., 14
,, *Wallichii*, Planch. 7
Corallodendron holosericeum, Kuntze, 72
,, *lithospermum*, Kuntze, 74
,, *sumatranum*, Kuntze, 74
Cordylanthes frutescens, Bl., 366
CORNACEAE, 600
Coryzadenia trifoliolata, Griff., 343
CROTALARIA, Linn., 35
,, *acuminata*, G. Don, 39
,, *alata*, Ham., 36
,, albida, *Heyne*, 39
,, *anthylloides*, Lamk, 37
,, *angulosa*, Lamk, 39
,, *bialata*, Roxb.. 36
,, *Brownei*, Bert., 41
,, *brevipes*, Champ., 37
,, *calycina*, Kurz, 37
,, *canescens*, Wall., 38
,, Chinensis, *Linn.*, 37
,, *coerulea*, Jacq., 39
,, crassifolia, Ham., 38
,, *cuneifolia*, Schrank, 39
,, *elliptica*, Roxb., 40
,, *eriantha*, Sieb. & Zucc., 37
,, *ferruginea*, Grah., 37
,, *heterophylla*, Linn. f., 42
,, *herbacea*, Schweig, 40
,, incana, Linn., 40
,, *leioloba*, Bartl., 38
,, *latifolia*, Roxb., 41
,, laburnifolia, *Linn.*, 41
,, *macrophylla*, Weinm., 39
,, *macrophylla*, Willd., 43
,, *montana*, Roxb., 39
,, *nepalensis*, Link, 37
,, *Oldhami*, Miq., 37
,, *parva*, Grah., 39
,, *pendula*, Benth., 41
,, *pedunculosa*, Desv., 41
,, *punctata*, Grah., 39
,, *pilosissima*, Miq., 38
,, quinquefolia, *Linn.*, 42
,, retusa, *Linn.*, 38
,, *sagitticaulis*, Wall., 36
,, *salicifolia*, Ham., 37
,, Saltiana, *Andr.*, 41
,, *Schimperi*, A. Rich., 40
,, sericea, *Retz*, 38
,, sessiliflora, *Linn.*, 36
,, *spectabilis*, Roth, 39
,, striata, DC., 41
,, *tenuis*, Wall., 39
,, *tuberosa*, Ham,, 44
,, uncinella, *Lam.*, 40
,, *venusta*, Wall., 37
,, verrucosa, *Linn.*, 39

CROTALARIA, *Vachelli*, Hook. & Arn., 40
Crithium indicum, Rumph., 597
Crudia caudata, *Prain*, 219
,, Curtisii, *Prain*, 220
,, ,, var. Wallichii, 221
,, glauca, *Prain*, 221
,, gracilis, *Prain*, 223
,, Scortechinii, *Prain*, 220
,, speciosa, *Prain*, 222
,, Wrayi, *Prain*, 222
Cruminium giganteum, Desv., 58
CRYPTERONIA, Blume
,, *glabra*, Bl., 349
,, Griffithii, *Clarke*, 350
,, paniculata, *Bl.*, 349
,, *pubescens*, Bl., 349
Cryptotheca apetala, Bl., 348
Cucumis *integrifolius*, Roxb., 376
,, *aegyptiacus*, Vesl., 378
,, *missionis*, Wall., 371
CUCURBITACEAE, 368
Cucurbita Melopepo, Wall., 373
Cyanites sylvatica, Reinw., 298
CYNOMETREAE, 29
CYNOMETRA, Linn.
,, cauliflora, *Linn.*, 197
,, *bijuga*, Span., 198, 199
,, inaequalifolia, *A. Gray*, 199
,, *mimosoides*, Wall., 198
,, *polyandra*, Miq., 198
,, polyandra, *Roxb.*, 200
,, ,, var. typica, 200
,, ,, var. ? Kurzii, 200
,, ramiflora, *Linn.*, 197
,, ,, subsp. genuina, 198
,, ,, subsp. bijuga, 198
,, ,, ,, var. heterophylla, 198
,, ,, ,, var. mimosioides
,, *ramiflora*, Miq., 198
,, *ramiflora*, Bedd., 198
Cytisus Cajan, Linn., 47
,, *pseudo-cajan*, Jacq., 47
Dadau, 192
Dadaub, 192
DALBERGIEAE, 26
DALBERGIA, Linn. fil.
,, *arborea*, Willd., 95
,, confertifolia, *Benth.*, 114
,, Championii, *Thw.*, 119
,, *Cumingiana*, Benth., 122
,, Hullettii, *Prain*, 119
,, Junghuhnii, *Benth.*, 115
,, ,, var. typica, 115
,, ,, var. Scortechinii, 115
,, Kunstleri, *Prain*, 121
,, *livida*, Wall., 118
,, menoeides, *Prain*, 120
,, Millettii, *Benth.*, 118
,, *monosperma*, Dalz., 120
,, *multijuga*, Grah., 118
,, parviflora, *Roxb.*, 121
DALBERGIA, pseudo-Sissoo, *Miq.*, 118
,, reniformis, *Roxb.*, 121, 122
,, *rufa*, Grah., 117
,, Scortechinii, *Prain*, 115
,, Sissoo, *Roxb.*, 119
,, *Sissoo*, Miq., 119
,, spinosa, *Roxb.*, 123
,, subsympathetica, *Prain*, 116
,, tamarindifolia, *Roxb.* 117
,, timorensis, *DC.*, 101
,, torta, *Grah.*, 120
,, velutina, *Benth.*, 116
,, ,, var. Maingayi, 117
,, ,, var. typica, 117
,, volubilis, *Roxb.*, 114
,, *Zollingeriana*, Miq., 122
Dalbergaria, 114
Daphniphyllopsis capitata, Kurz, 608
DATISCACEAE, 574
DECASPERMUM, Forst., 505
,, paniculatum, *Kurz*, 506
,, ,, var. Finlaysoniana, *Duthie*, 506
Deguelia timorensis, *Taub.*, 101
Dendrolobium umbellatum, Benth., 137
Dendropanax Maingayi, *King*, 402
,, *parviflorum*, Clarke, 402
,, parviflorum, *Benth.*, 402
DERRIS, Lour.
,, affinis, *Benth.*, 204
,, amoena, *Benth.*, 105
,, ,, var. Maingayana, 106
,, ,, var. typica, 106
,, andamanica, *Prain*, 104
,, *cuneifolia*, var. *malaccensis*, Benth., 107
,, dalbergioides, *Baker*, 101
,, ,, var. dasyphylla, *Scort.*, 102
,, elegans, *Benth.*, 103
,, ,, var. typica, 103
,, ,, var. vestita, 103
,, elliptica, *Benth.*, 106
,, eualata, *Bedd.*, 104
,, *Forsteniana*, Bl., 103
,, floribunda, Benth., 105
,, guianensis, *Benth.*, 101
,, heterophylla, *Willd.*, 103
,, macrophylla, *Benth.*, 79
,, *Maingayana*, Baker, 106
,, malaccensis, *Prain*, 107
,, ,, var. ? aptera, 108
,, ,, var. ? millettioides, 108
,, ,, var. typica, 107
,, marginata, *Benth.*, 105
,, montana, *Benth.*, 108
,, *monticola*, Kurz, 109
,, *pinnata*, Lour., 118
,, *pyrrhothyrsa*, Miq., 99
,, scandens, *Benth.*, 100
,, sinuata, *Thw.*, 98
,, *sinuata*, Prain, 104
,, thyrsiflora, *Benth.*, 97, 78

Derris, *thyrsiflora*, Prain MSS., 99
,, uliginosa, *Benth.*, 102
,, ,, var. Loureirii, *Benth.*, 105
,, *vestita*, Baker, 103
,, Wallichii, *Prain*, 199
Desmodieae, 27
Desmodium, Desv.
,, alatum, *DC.*, 144
,, *angulatum*, Wall., 140
,, auriculatum, *DC.*, 144
,, *bicolor*, Wall., 141
,, *Buergeri*, Miq., 140
,, capitatum, *DC.*, 139
,, Cephalotes, *Wall.*, 138
,, *coespitosum*, DC., 136
,, *diffusum*, DC., 141
,, *elongatum*, Wall., 141
,, gangeticum, *DC.*, 142
,, ,, var. *acuminatum*, 143
,, *Gardneri*, Benth., 139
,, gyroides, *DC.*, 145
,, *gyroides*, Hassk., 140
,, *heterocarpum*, DC., 140
,, *heterophyllum*, Wall., 135
,, heterophyllum, *DC.*, 135
,, *latifolium*, Bak., 143
,, *latifolium*, Wight, 143
,, ,, var. *virgatum*, *Miq.*, 143
,, laxiflorum, *DC.*, 141
,, laxum, *DC.*, 138
,, *leptostachyum*, Wall., 141
,, megaphyllum, *Zoll.*, 139
,, *nervosum*, Vog., 140
,, *obovatum*, Wall., 140
,, ormocarpoides, *DC.*, 142
,, ,, var. velutina, 142
,, *ovalifolium*, Wall., 140, 141
,, *patens*, Wight, 140
,, *podocarpum*, Miq., 139
,, polycarpum, *DC.*, 140
,, *polycarpum*, W. & A., 140
,, ,, var. *ovalifolia*, 141
,, ,, var. *typica*, 141
,, *pseudo-gyroides*, Miq., 145
,, pseudo-triquetrum, *DC.*, 144
,, pulchellum, *Benth.*, 136
,, *recurvatum*, Grah., 141
,, *retusum*, G. Don, 140
,, rugosum, *Prain*, 137
,, *siliquosum*, DC., 140
,, *sulcatum*, Wall., 141
,, *triflorum*, Wall., 136
,, triflorum, *DC.*, 135
,, ,, var. *minus*, W. & A., 135
,, ,, var. majus, W. & A., 136
,, triquetrum, *DC.*, 143
,, *triquetrum*, Bak., 145
,, umbellatum, DC., 137
,, *umbellatum*, Wall., 138
Desmodium, virgatum, *Zoll.*, 143
,, Wallichii, 138
,, *zonatum*, Miq., 142
Desmanthus lacustris, DC., 245
,, *natans*, Willd., 245
,, *stolonifer*, DC., 245
Dialum, Linn.
,, ambiguum, *Prain*, 172
,, indum, *Linn.*, 169
,, *javanicum*, Burm., 170
,, Kingii, *Prain*, 175
,, Kunstleri, *Prain*, 168
,, laurinum, *Baker*, 170
,, Maingayi, Baker, 171
,, patens, *Baker*, 169
,, platysepalum, *Baker*, 172
,, ,, var. burong, 173
,, ,, var. papan, 173
,, ,, var. typica, *Prain*, 173
,, ,, var. *typica*, Bak., 174
,, Wallichii, *Prain*, 174
Dicerma repens, Grah., 136
,, *pulchellum*, DC., 137
Dichroa *cyanites*, Miq., 298
,, febrifuga, *Lour.*, 298
,, *latifolia*, Miq., 298
,, *Fergusonii*, Thw., 60
,, javanica, *Benth.*, 60
,, reflexa, *Hook. fil.*, 59
Diocleae, 25
Diplocliniium biloculare, Wight, 588
,, *Hasskarlianum*, Miq., 590
,, *repandum*, Klotsch, 587
,, *tuberosum*, Miq., 594
Dipteroderris, 104
Disemma Horsfieldii, Miq., 579
Dissochaeta, Blume, 457
,, *anceps*, Naud., 466
,, anomala, *King*, 463
,, annulata, *Hook. fil.*, 458
,, *astrotricha*, Miq., 461
,, *bancana*, Miq., 462
,, bracteata, *Blume*, 460
,, *bracteosa*, Naud., 460
,, celebica, *Blume*, 462
,, ,, var. contracta, *King*, 462
,, *divaricata*, Naud., 466
,, *glauca*, Bl., 465
,, gracilis, *Blume*, 461
,, hirsuta, *Hook. fil.*, 459
,, intermedia, *Blume*, 462
,, *intermedia*, Scort., 464
,, *microcarpa*, Naud., 462
,, ovalifolia, Naud., 461
,, *Palembanica*, Miq., 466
,, pallida, *Blume*, 460
,, *pipericarpa*, Naud., 466
,, punctulata, *Hook. fil.*, 459
,, Scortechinii, *King*, 463
,, *spoliata*, Naud., 465
,, *superba*, Naud., 461

Djenkol, 266
DOLICHOS, Linn.
,, *bulbosus*, Linn., 54
,, *Catjang*, Linn., 52
,, *coriaceus*, Grah., 60
,, *crassus*, Grah., 46
,, *cultratus*, 55
,, *ensiformis*, Linn., 62
,, erosus, *Linn.*, 54
,, *giganteus*, Willd., 68
,, *gladiatus*, Jacq., 62
,, *hexandra*, Roxb., 60
,, Lablab, *Linn.*, 54
,, ,, var. typica, 55
,, ,, var. lignosa, 55
,, *Lablab*, Roxb., 55
,, *lineatus*, Thunb., 63
,, *lignosus*, Roxb., 55
,, *luteus*, Sw., 52
,, *obcordatus*, Roxb., 63
,, *obtusifolius*, Lam., 64
,, *ovatus*, Grah., 56
,, *phaseoloides*, Roxb., 61
,, *pilosus*, Roxb., 53
,, *pruriens*, Linn., 69
,, *reticulatus*, Ham., 46
,, *reticulatus*, Ait., 46
,, *rotundifolius*, Vahl., 64
,, *scarabaeoides*, Linn., 46
,, *sinensis*, Linn., 52
,, stipulaceus, *Lam.*, 49
,, *tetragonolobus*, Linn., 56
,, *tranquebaricus*, Jacq., 53
,, *trilobus*, Linn., 49
,, trilobus, *Lour.*, 54
,, *viridis*, Ham., 61
Dollinera, 139
Doodia picta, Roxb., 130
,, *crinita*, Roxb., 131
,, *lagopodioides*, Roxb., 131
Doxomma acuminatum, Miers, 568
,, *cylindrostachyum*, Miers, 568
,, *magnificum*, Miers, 569
,, *macrostachyum*, Miers, 568
,, *pendulum*, Miers, 568
Drebbelia ferruginea, Zoll., 75
Drepanocarpus Cumingii, Kurz, 122
DROSERACEAE, 305
DROSERA, Linn., 575
,, Burmanni, *Vahl.*, 575
,, *Finlaysoniana*, Wall., 576
,, *foliosa*, Hook., 576
,, *gracilis*, Hook., 576
,, indica, *Linn.*, 576
,, Lobbiana, Turcz., 576
,, *lunata*, Ham., 576
,, peltata, Sm., 576
,, *serpens*, Planch., 576
Dryptopetalum coriaceum, Arn., 322
Duabanga *grandiflora*, Walp., 354
,, sonneratioides, *Ham.*, 354
Duchassaingia ovalifolia, Walp., 72
DUNBARIA *Horsfieldii*, Miq., 46
,, Scortechinii, *Prain*, 44
Echinocalyx, Benth., 204
Elaeocarpus ? punctatus, Wall., 278
ELLIPANTHUS, Hook. fil., 8
,, calophyllus, *Kurz*, 9
,, Curtisii, *King*, 9
,, gibbosus, *King*, 10
,, Griffithii, *Hook. fil.*, 10
,, Scortechinii, *King*, 8
,, Helferi, *Hook. fil.*, 10
Embryogonia lucida, Bl., 336
Enkylia digyna, Griff., 384
,, *trigyna*, Griff., 384
ENTADA, Adans.
,, *monostachya*, DC., 242
,, *Pursaetha*, DC., 242
,, *Parrana*, Spreng., 242
,, *Rheedii*, Spreng., 242
,, *Rumphii*, Scheff., 242
,, scandens, *Benth.*, 242
Enterolobium Saman, *Prain*, 252
Epilobium fruticosum, Lour., 356
Eriosema chinense, *Vog.*, 44
ERYNGIUM, Linn., 599
,, foetidum, *Linn.*, 599
ERYTHRINEAE, 25
ERYTHRINA, Linn.
,, *Corallodendrum*, Linn., 71
,, *cuneata*, Grah., 71
,, *holosericea*, Kurz, 72, 73
,, indica, *Lamk.*, 70
,, lithosperma, *Miq.*, 73
,, *lithosperma*, Bl., 73, 74
,, ovalifolia, *Roxb.*, 72
,, *secundiflora*, Hassk., 73
,, stricta, *Roxb.*, 71
,, suberosa, *Linn.*, 73
,, *sumatrana*, Miq., 73
,, *spathacea*, Wall., 71
Erythrostigma ellipticum, Zoll.
,, *obliquum*, Zoll.
,, *villosum*, Zoll.
EUCAESALPINIEAE, 29
Eucaesalpinia, 227
Eucynometra, 147
Euderris, 102
Eudesmodium, 138
EUGENIA, Linn., 507
,, *acutangula*, Linn., 570
,, acuminatissima, *Kurz*, 556
,, aemula, *Bl.*, 516
,, *alba*, Roxb., 511
,, *anacardifolia*, King MSS., 514
,, andamanica, *King*, 536
,, anisophylla, *Duthie*, 526
,, *anisosepala*, Duthie, 526
,, Benjamina, *King*, 536
,, Bernardi, *King*, 545
,, borneensis, *Miq.*, 562
,, *brachiata*, Duthie
,, bracteolata, *Wight*, 552

EUGENIA, Burkilliana, *King*, 524
,, *calyptrata*, Roxb., 562
,, *caryophyllifolia*, Lam., 562
,, caudata, *King*, 535
,, *cerasoides*, Roxb., 560
,, chorantha, *Duthie*, 527
,, chloroleuca, *King*, 543
,, Clarkeana, *King*, 523
,, claviflora, *Roxb.*, 537
,, ,, excavata, *King*, 538
,, ,, glandulosa, *King*, 538
,, ,, leptantha, *King*, 538
,, ,, Maingayi, *King*, 538
,, coarctata, *Bl.*, 516
,, *comosa*, Wall., 545
,, conglomerata, *Duthie*, 531
,, corrugata, *King*, 523
,, *corymbosa*, Roxb., 515
,, *corymbosa*, Wall., 530
,, crenulata, *Duthie*, 521
,, Curtisii, *King*, 559
,, ,, var. minor, *King*, 559
,, *cuspidata*, Wall., 566
,, *cymosa*, Roxb., 521
,, cymosa, *Roxb.*, 530
,, densiflora, *Duthie*, 514
,, *diospyrifolia*, Wall., 516
,, Duthieana, *King*, 533
,, Dyeriana, *King*, 518
,, ,, var. oblonga, *King*, 518
,, *elliptica*, Wall.
,, expansa, *Duthie*, 543
,, *fastigiata*, Bl., 543
,, filiformis, *Wall.*, 535
,, *firma*, Wall., 521
,, formosa, *Wall.*, 510
,, *frondosa*, Wall., 561
,, fusiformis, *Duthie*, 562
,, Gageana, *King*, 526
,, garcinifolia, *King*, 520
,, *glandulifera*, Roxb., 539
,, glauca, *King*, 532
,, ,, var. pseudo-glauca, *King*, 532
,, Goodenovii, *King*, 547
,, grandis, *Wight*, 521
,, ,, var. *lepidocarpa*, 520
,, grata, *Wight*, 539
,, Griffithii, *Duthie*, 522
,, Helferi, *Duthie*, 525
,, Hemsleyana, *King*, 518
,, Hoseana, *King*, 536
,, Hullettiana, *King*, 527
,, inasensis, *King*, 550
,, Inophylla, *Roxb.*, 544
,, *Inophylla*, Wall., 545, 547
,, Jambolana, *Lam.*, 561
,, Jambos, *Linn.*, 512
,, javanica, *Lamk.*, 511
,, ,, var. Roxburghiana, *Duthie*, 512
,, Kinabaluensis, *Stapf*, 549
,, Koordersiana, *King*, 558
EUGENIA, Kunstleri, *King*, 557
,, Kurzii, *Duthie*, var. andamanica, 525
,, laevicaulis, *Duthie*, 546
,, lepidocarpa, *Wall.*, 519
,, lineata, *Duthie*, 529
,, linoceroidea, *King*, 548
,, *lucidula*, Miq., 534
,, macrocarpa, *Roxb.*, 516
,, macrophylla, *Lam.*, 513
,, Maingayi, *Duthie*, 562
,, malaccensis, *Linn.*, 512
,, Manii, *King*, 534
,, microcalyx, *Duthie*, 554
,, ,, var. obovata, *King*, 555
,, minutiflora, *Miq.*, 533
,, mollis, *King*, 516
,, *Mooreï*, F. Müll, 561
,, myriantha, *King*, 555
,, myrtifolia, *Roxb.*, 548
,, nicobarica, *King*, 560
,, nigricans, *King*, 544
,, *nigrescens*, Poir, 530
,, *nitida*, Duthie, 534
,, oblata, *Roxb.*, 544
,, oblongifolia, *Duthie*, 541
,, ,, var. parviflora, *King*, 542
,, ,, var. robusta, *King*, 542
,, *obtusifolia*, Roxb., 562
,, *occlusa*, Kurz, 561
,, operculata, *Roxb.*, 559
,, ,, var. Paniala, *King*, 560
,, ,, var. obovata, *Kurz*, 560
,, ,, var. coriacea, *King*, 560
,, pachyphylla, *Kurz*, 519
,, *Paniala*, Roxb., 560
,, papillosa, *Duthie*, 514
,, Pearsoniana, *King*, 546
,, penangiana, *Duthie*, 528
,, pendens, *Duthie*, 524
,, Perakensis, *King*, 511
,, pergamentacea, *King*, 517
,, plumbea, *King*, 515
,, polita, *King*, 540
,, *polygama*, Roxb, 506
,, polyantha, *Wight*, 533
,, Prainiana? *King*, 546
,, pseudo-formosa, *King*, 513
,, pseudo-tetraptera, *King*, 539
,, pseudo-subtilis, *King*, 553
,, ,, var. platyphylla, *King*, 554
,, ,, var. subacuminata, *King*, 554
,, punctulata, *King*, 552
,, *purpurea*, Roxb., 513
,, pustulata, *Duthie*, 557
,, pyrifolia, *Duthie*, 529
,, quadrata, *King*, 516
,, *racemosa*, Linn., 567
,, Ridleyi, *King*, 528
,, *rhodomela*, Comm., 530

EUGENIA, rubricaulis, *Miq.*, 530
,, *samarangensis*, DC., 510
,, scalarinervis, *King*, 517
,, scoparia, *Wall.*, 555
,, Scortechinii, *King*, 515
,, ,, var. parvifolia, *King*, 516
,, setosa, *King*, 550
,, simulans, *King*, 558
,, *spicata*, Lam., 538
,, Stapfiana, *King*, 549
,, sub-decussata, *Duthie*, 551
,, ,, var. colorata, *King*, 551
,, ,, var. montana, *King*, 551
,, subhorizontalis, *King*, 542
,, subrufa, *King*, 532
,, ,, var. robusta, *King*, 533
,, Swettenhamiana, *King*, 556
,, tecta, *King*, 539
,, ? *trinervia*, DC., 504
,, Thumra, *Roxb.*, var. Penangiana, *King*, 522
,, *tumida*, Duthie, 529, 562
,, urceolata, *King*, 531
,, valdevenosa, *Duthie*, 541
,, Valetoniana, *King*, 542
,, variolosa, *King*, 537
,, venulosa, *Wall.*, 553
,, ,, var. macrothyrsa, *King*, 553
,, verecunda, *Duthie*, 555
,, Wrayi, *King*, 549
,, zeylanica, *Wight*, 538
,, *zeylanica*, Duthie, 540
,, *Zippelliana*, Miq., 548
Eumezoneuron, 232
EUMIMOSEAE, 30
EUPHASEOLEAE, 24
Eusesbania, 82
Eupteron, Kurz, 403
Ewyckia capitata, Walp., 477
,, *capitellata*, Walp., 477
,, *cyanea*, Bl., 476, 477
,, *cyanea*, Korth, 477
,, ,, var. *latifolia*, 477
,, *Jackiana*, Walp., 476
,, *latifolia*, Bl., 477
,, *medinilliformis*, Naud., 477
,, *paniculata*, Miq., 477
Farnesia odora, Gaspar., 249
FICOIDEAE, 596
Fistula, *DC.*, 155
FLEMINGIA, Roxb., 42.
Flemingia *abrupta*, Wall., 43
,, congesta, *Roxb.*, 43
,, strobilifera, *R. Br.*, 42
GALACTIEAE, 25
Galedupa arborea, Roxb., 95
,, *indica*, Lam., 95, 207
,, *intermedia*, Prain MSS,, 205
,, *ulignosa*, Roxb., 103
,, *elliptica*, Roxb., 107
Galedupa Echinocalyx, Prain MSS., 204
,, *velutina*, Prain MSS., 206
,, *Wallichiana*, Prain MSS., 203
GALEGEAE, 25
Galega purpurea, Linn., 85
Gapis, 211
Gapis Kognet, 212, 213
GENISTEAE, 23
Gerdas Padi, 265
Getonia floribunda, Roxb., 333
,, *nutans*, Roxb., 333
,, *nitida*, Roth, 333
Gilibertia palmata, DC., 402
Glycineae, 24
Glycine debilis, DC., 59
,, *labialis*, Linn., 59
,, *pallens*, Grah., 59
,, *parviflora*, DC., 59
Gonocarpus micranthus, Thunb., 310
Goniocarpus micranthus, Koen. and Sims, 310
Granadilla, 579
Guilandina, *Bonduc*, W. & A., 226, 227
,, *Bonducella*, Linn., 226
,, *Nuga*, Linn., 227
,, *Wallichiana*, Grah., 203, 204
Gustavia globosa, Span., 571
GYMNOPETALUM, Arn., 375
,, Cochin-chinensis, *Kurz*, 376
,, *heterophyllum*, Kurz, 377
,, integrifolium, *Kurz*, 375
,, quinquelobum, *Miq.*, 376
,, *septemlobum*, *Miq.*, 379
GYNOSTEMMA, Blume, 384
,, *cissoides*, Franch. et Sav., 384
,, pedata, *Bl.*, 384
,, *laxa*, Cogn., 384
GYNOTROCHES, Blume, 321
,, axiliaris, *Bl.*, 321
,, *Dryptopetalum*, Bl., 322
,, *reticulata*, A. Gray, 322
GYROCARPUS, Jacq., 344
,, *acuminatus* Meissn., 345
,, americanus, *Jacq.*, 344
,, *asiaticus*, Willd., 345
,, *Jacquinii*, Gaertn., 344
,, *rugosus*, R. Br., 345
,, *sphenopterus*, R. Br., 345
HALORAGEAE, 309
Haloragis disticha, Jack, 323
,, micrantha, *R. Br.*, 310
,, *tenella*, Brongn., 310
,, *oligantha*, W. & A., 311
HAMAMELIDEAE, 306
Haplocarpum indicum, Miq., 348
,, *vesicatorium*, Miq., 348
Hedera ? *cheirantha*, Jack, 402
,, *ferruginea*, Wall., 402
,, *heterophylla*, Wall., 400
,, *Jackiana*, G. Don, 403

Hedera ? *ovata*, Wall., 403
,, *palmata*, Wall., 402
,, *polycantha*, Wall., 406
,, *terebinthacea*, Wall., 396
,, *venulosa*, Wall., 396
Hederopsis Maingayi, *Clarke*, 406
HEDYSAREAE, 27
Hedysarum adhaerens, Poir., 142
,, *alatum*, Roxb., 144, 145
,, *arboreum*, Roxb., 137
,, *capitatum*, Burm., 140
,, *collinum*, Roxb., 142
,, *conicum*, Poir., 140
,, *crinitum*, Linn., 131
,, *cylindricum*, Poir., 133
,, *diffusum*, Roxb., 142
,, *diphyllum*, Linn., 126
,, *gangeticum*, Linn., 142
,, *gyroides*, Roxb., 145
,, *heterocaulon*, Linn., 141
,, *heterophyllum*, Willd., 136
,, *lagenarium*, Roxb., 129
,, *lagopodioides*, Linn., 131
,, *lagopodioides*, Burm., 131
,, *Neli-Teli*, Roxb., 128
,, *nummularifolium*, Linn., 133
,, *ormocarpoide*, Desv., 142
,, *patens*, Roxb., 141
,, *pictum*, Jacq., 130
,, *polycarpum*, Lam., 140
,, *pulchellum*, Linn., 136
,, *purpureum*, Roxb., 141
,, *recurvatum*, Roxb., 142
,, *reptans*, Roxb., 136
,, *retusum*, Don, 141
,, *Rottleri*, Spr., 142
,, *Roxburghii*, Spr., 142
,, *siliquosum*, Burm., 141
,, *stipulaceum*, Burm., 135
,, *strobiliferum*, Linn., 43
,, *triflorum*, Linn., 135
,, *triquetrum*, Linn., 144
,, *umbellatum*, Linn., 136
,, *varium*, Roth., 133
,, *vaginale*, Llnn., 133
,, *Vespertilionis*, Linn. fil., 132
Hegetschweilera pulchella, Reg., 133
Hemiandra borneensis, Hook. fil., 17
Henslovia affinis, Planch., 349
,, *glabra*, Wall., 349
,, *Hookeri*, Wall., 349
,, *leptostachys*, Planch., 349
,, *pubescens*, Wall., 349
HEPTAPLEURUM, Gaertn., 392
,, affine, *King*, 398
,, avene, *Seem.*, 391
,, biternatum, *Clarke*, 400
,, *capitatum*, Seem., 393
,, Cephalotes, *Clarke*, 393
,, Curtisii, *King*, 400
,, ellipticum, *Seem.*, 397
,, heterophyllum, *Seem.*, 400
HEPTAPLEURUM, Hullettii, *King*, 398
,, latifoliolatum, *King*, 395
,, luridum, *King*, 392
,, nervosum, *King*, 399
,, Ridleyi, *King*, 398
,, scandens, *Seem.*, 397
,, Scortechinii, *King*, 393
,, Singalangense, *Seem.*, 395
,, sub-racemosum, *King*, 393
,, subulatum, *Seem.*, 395
,, tomentosum, *Hassk.*, 394
,, triste, *King*, 392
,, venulosum, *Seem.*, 396
,, Wrayi, *King*, 399
Heteropanax fragrans, *Seem.*, 405
Heteroloma, 142
Hiraea Finlaysoniana, Wall., 506
HODGSONIA, Hook. fil. & Th., 369
,, heteroclita, *Hook. fil. & Th.*, 369
,, *macrocarpa*, Cogn., 370
HOMALIUM, Jacq., 364
,, *caryophyllaceum*, Benth., 366
,, *condylanthes*, Benth., 366
,, *foetidum*, Benth., 366
,, frutescens, *King*, 366
,, grandiflorum, *Benth.*, 367
,, Griffithianum, *Kurz*, 365
,, Kunstleri, *King*, 364
,, longifolium, *Benth.*, 364
,, propinquum, *Clarke*, 365
,, undulatum, *King*, 367
Hyaphorus, *Hassk.*, 73
HYDROCOTYLE, Linn., 598
,, asiatica, *Linn.* 599
,, *Heyneana*, Wall., 599
,, *hirsuta*, Bl., 599
,, *hirta*, R. Br., var. *acutiloba*, F. Müll, 599
,, *hispida*, Don, 599
,, Javanica, *Thunbg.*, 598
,, *lurida*, Hance, 599
,, *nepalensis*, Hook., 599
,, *polycephala*, W. & A., 599
,, *strigosa*, Wall., 599
,, Wightiana, DC., 599
,, *zeylanica*, DC., 599
Hypericinea pimentifolia, Wall., 503
Ilex daphniphylloides Kurz, 608
ILLIGERA, Blume, 343
,, appendiculata, *Bl.*, 343
,, ,, var. Kurzii, 343
,, *Coryzadenia*, Meissn., 343
,, lucida, *Teysm. & Binn.*, 344
INDIGOFERA, Linn., 81
,, Anil, *Linn.*, 81
,, *ferruginea*, Schum. & Thonn., 81
,, *Finlaysoniana*, Wall., 82
,, galegioides, *DC.*, 82
,, hirsuta, *Linn.*, 81
,, *indica*, Lamk., 81

INDIGOFERA *Sumatrana*, Gaertn., 81
,, tinctoria, *Linn.*, 81
,, ,, var. *anil*, Kurz, 81
,, *uncinata*, Roxb., 82
Inga acutangula, Grah., 275
,, *attenuata*, Grah., 266
,, *bigemina*, Bl., 266
,, *bubalina*, Jack, 265, 266, 268
,, *Clypearia*, Wall., 270, 274
,, *contorta*, Grah., 273
,, *dimidiata*, Hook. & Arn., 274
,, *dolabaiformis*, Grah., 245
,, *dulcis*, Willd., 264
,, *elliptica*, Bl., 270
,, *Finlaysoniana*, Wall., 251, 273
,, *grandiflora*, Wall., 251
,, *firinga*, Jack, 266, 270
,, *lignosa*, Grah., 245
,, *lobata*, Grah., 266
,, *lucida*, Wall., 261
,, *Saman*, Willd., 252
,, *umbrosa*, Wall., 253
,, *ventricosa*, Grah., 251
,, *xylocarpa*, DC., 245
Ingria, 265
Intsia amboinensis, Thouars, 208
Involucraria Wallichii, Ser., 373, 374
Itea fragrans, Wall., 302, 303
Jambosa acuminatissima, Hassk., 557
,, *alba*, Rumph., 511
,, *ambigua*, Bl., 511
,, *borneensis*, Miq., 562
,, *bracteata*, Miq., 539
,, *densiflora*, DC., 515
,, *domestica*, Rumph., 513
,, ,, var. *purpurea*, Bl., 513
,, *firma*, Bl., 521
,, *formosa*, Walp., 510
,, *grandis*, Bl., 521
,, *Inophylla*, Miq., 544
,, *insignis*, Bl., 511
,, *lineata*, DC., 530
,, *macrophylla*, DC., 511
,, *macrophylla*, Spreng., 513
,, *mappacea*, Korth., 510
,, *malaccensis*, DC., 513
,, *nigra*, Rumph., 513
,, *pulchella*, Miq., 545
,, *punctulata*, Miq., 552
,, *purpurascens*, DC., 513
,, *purpurea*, Wall., 513
,, *Samarangensis*, Korth., 511
,, *tenuicuspis*, Miq., 530
,, *urceolata*, Korth., 521, 531
,, *vulgaris*, DC., 512
Jambolifera pedunculata, Gaertn., 562
Jereng, 266, 267
Jiring mumet, 274
Jonesia Asoca, Roxb., 214
,, *declinata*, Jack, 212
,, *palembanica*, Miq., 216, 217
,, *pinnata*, Willd., 214
Jonesia scandens, Roxb., 217
,, *triandra*, Roxb., 217
Juglans Catappa, Lour., 331
JUSSIAEA, Linn., 355
,, *angustifolia*, Lam., 356
,, Burmanni, DC., 356
,, *decumbens*, Wall., 356
,, *exaltata*, Roxb., 356
,, *fruticosa*, DC., 356
,, *longipes* Griff., 356
,, *octophila*, DC., 356
,, repens, *Linn.*, 357
,, *scabra*, *Willd.*, 356
,, suffruticosa, *Linn.*, 356
,, *villosa*, Lam., 356
Kada-ong, 240
Kandellia Rheedii, W. & A., 317
Kanilia caryophyllooides, Bl. 315
,, *parviflora*, Bl., 316
Karanj, 96
Kathsola, 83
Kawas, 268
Kayoe lakka, 122
Kayu Batai, 225
Kayu laha, 123
Kellor-laut, 257
Kibessia acuminata, Dcne, 478
,, *cupularis*, Dcne., 478
,, *echinata*, Cogn., 478
,, *pubescens*, Dcne, 478
,, *simplex*, Korth., 478
Kiesera sericea, Reinw., 85
Kiljang, 271
Koeringa, 266
Koran, 173
Kradus, 269
Kranji, 170, 172
Kranji ambot, 171, 173
,, *borong*, 170, 174
,, *padie*, 170, 174
,, *papan*, 171, 174
Kranji's Kelat, 171, 173
Kraunhia albiflora, Prain MSS., 93
,, *cauliflora*, Prain MSS., 94
,, *decipiens*, Prain MSS., 91
,, *Hemsleyana*, Prain MSS., 90
,, *oocarpa*, Prain MSS., 92
,, *unifoliata*, Prain MSS., 93
Kumpass, 166
Kumpas ruman, 221
KUMPASSIA, Maing., 165
,, Beccariana, *Taub.*, 166
,, excelsa, *Taub.*, 167
,, malaccensis, *Maing.*, 166
,, parvifolia, Prain, 166
KUNSTLERIA, Prain., 109
,, Curtisii, *Prain*, 110
,, ,, var. laxiflora, *Prain*, 110
,, Derryi, *Prain*, 112
,, Forbesii, *Prain*, 111
,, Kingii, *Prain*, 110

KUNSTLERIA, Ridleyi, *Prain*, 111
Lablab vulgaris, Savi., 55
,, *cultratus*, Forsk., 55
,, *cultratus*, DC., 55
,, *microcarpus*, DC., 55
Lacca Lignum, 122
Lagenaria dasystemon, Franch. et Sav., 379
LAGERSTROEMIA, Linn., 350
,, *celebica*, Bl., 352
,, Flos-Reginae, *Retz*, 352
,, floribunda, *Jack*, 351
,, *grandiflora*, Griff, 354
,, *hexaptera*, Miq., 352
,, hypoleuca, *Kurz*, 351
,, macrocarpa, *Wall.*, 353
,, *Munchhausia*, Lamk., 353
,, ovalifolia, *Teysm. et Binn.*, 352
,, *Reginae*, Roxb., 353
,, *speciosa*, Pers., 353
Lasiobema anguinum, Korth, 194
,, *Horsfieldii*, Miq., 194
LEGUMINOSAE, 21
Leptospartium grandiflorum, Griff., 354
Leptospron, *Bth. & H. f.*, 48
LEPTOSPERMUM, Forst., 499
,, *amboinensis*, Bl., 499
,, flavescens, *Sm.*, 499
,, ,, var. commune, *Benth.*, 499
,, ,, var. javanica, *King*, 500
,, *floribundum*, Jungh., 500
,, *javanicum*, Bl., 500
,, *polygalifolium*, Salisb., 499
,, *porophyllum*, Cav., 499
,, *Thea*, Willd., 499
Lespedeza lagopoides, Pers., 131
Leucaena glauca, *Benth.*, 246
Lignum Sappan, Rumph., 229
Lingoum saxatile, Rumph, 124
Liquidamber tricuspis, Miq., 308
Lotus fluminensis, Vell., 57
Lourea Vespertilionis, *Desv.*, 132
LUDWIGIA, Linn., 357
,, *diffusa*, Ham., 358
,, *fruticulosa*, Bl., 358
,, *jussiaeoides*, Wall., 357
,, *lythroides*, Bl., 357
,, parviflora, *Roxb.*, 357
,, prostrata, *Roxb.*, 357
LUFFA, Cav., 377
,, Aegyptiaca, *Mill*, 377
,, *acutangula*, W. & A., 378
,, *Cattu-picinna*, Ser., 378
,, clavata, *Roxb.*, 378
,, *cylindrica*, Roem., 378
,, *Gosa*, Wall., 378
,, *hederacea*, Wall., 378
,, *pentandra*, Roxb., 378
LUFFA *Petola*, Ser., 378
,, *Parvala*, Wall., 378
,, *racemosa*, Roxb., 378
,, *Satpatia*, Wall., 378
LUMNITZERA, Willd., 334
,, coccinea, *W. & A.*, 334
,, *littorea*, Voigt, 334
,, *pentandra*, Griff., 334
,, racemosa, *Willd.*, 334
Lupinus cochin-chinensis, Lour., 38
Lysiphyllum, *Benth.*, 178
LYTHRACEAE, 345
Lythrum Pemphis, Linn. fil., 348
Macklottia amboinensis, Korth., 499
,, *javanica*, Korth., 500
Maclellandia Griffithiana, Wight, 348
Macrolobium bijugum, Colebr., 208
Macrotropis bancana, Miq., 150
,, *sumatrana*, Miq., 150
MAINGAYA, Oliver, 307
,, malayana, *Oliv.*, 307
Malapari, 96
Malaparius, Rumph., 95
Malaparius flavus, Miq., 95
Mammea asiatica, Linn., 565
Maranthes multiflora, Korth., 283
Marlea Griffithii, Clarke, 605
,, *ebenacea*, Clarke, 606
,, *nobilis*, Clarke, 607
,, *unilocularis*, Griff., 605
MARUMIA, Blume, 455
,, *affinis*, Korth., 456
,, *echinata*, Naud., 456
,, *oligantha*, Naud., 457
,, nemorosa, *Blume*, 455
,, rhodocarpa, *Cogn.*, 456
,, ,, var. subglabrata, *Cogn.*, 457
,, reticulata, *Blume*, 457
,, *stellulata*, Korth., 457
,, *Zeylanica*, Triana, 456
Mash-Kulai, 50
MASTIXIA, Blume, 600
,, bracteata, *Clarke*, 601
,, *bracteata*, Scort. MSS,, 601
,, Clarkeana, *King*, 603
,, ,, var. macrophylla, *King*, 603
,, gracilis, *King*, 602
,, *Junghuhniana*, Clarke, 603
,, pentandra, *Bl.*, 603
,, Maingayi, *Clarke*, 602
,, ,, var. sub-tomentosa, *King*, 603
,, Scortechinii, *King*, 601
,, trichotoma, *Bl.*, 602
MEDINILLA, Gaud., 467
,, alternifolia, *Bl.*, 468
,, Clarkei, *King*, 471
,, *crassifolia*, Triana, 470
,, crassinervia, *Bl.*, 472
,, Hasseltii, *Bl.*, 470

EDINILLA, Hasseltii, var. Griffithii, *Clarke*, 470
,, heteranthera, *King*, 469
,, Horsfieldii, *Miq.*, 469
,, ,, var. latifolia, *King*, 469
,, *macrocarpa*, Clarke, 472
,, Maingayi, *Clarke*, 471
,, perakensis, *King*, 472
,, *rosea*, C. B. Clarke, 471
,, scandens, *King*, 468
,, Scortechinii, *King*, 470
,, speciosa, *Bl.*, 468
,, venusta, *King*, 469
MEMECYLEAE, 411
MEMECYLON, Linn., 479
,, *acuminatum*, Wall., 506
,, acuminatum, *Sm.*, 492, 506
,, ,, var. *flavescens*, Clarke, 489
,, *amabile*, Bedd., var. *malaccensis*, Clarke, 495
,, amplexicaule, *Roxb.*, 487
,, andamanicum, *King*, 493
,, *australe*, Muell, 492
,, caloneuron, *Miq.*, 484
,, campanulatum, *Clarke*, 488
,, *capitellatum*, Bl., 489
,, *capitellatum*, Span., 492
,, *celastrinum*, Kurz, 491
,, cinereum, *King*, 490
,, coeruleum, *Jack*, 488
,, *coeruleum*, Triana, 487
,, *cordatum*, Wall., 487, 488
,, costatum, *Miq.*, 486
,, ,, var. *ellipsoidea*, Bl., 484
,, *depressum*, Benth., 487
,, dichotomum, *Clarke*, 483
,, edule, *Roxb.*, 494
,, ,, var. ovata, *Clarke*, 495
,, ,, var. typica, *King*, 494
,, ,, var. *α*, Thw., 494
,, ,, var. γ, Thw., 495
,, epiphyticum, *King*, 482
,, elegans, *King*, 492
,, ,, var. minor, *King*, 492
,, ,, var. *dichotoma*, Clarke, 483
,, fruticosum, *King*, 482
,, garcinoides, *Bl.*, 493
,, ,, var. elongatum, *Bl.*, 494
,, *globiferum*, Wall., 494
,, grande, *Retz*, 491
,, ,, var. *pubescens*, Clarke, 483
,, ,, var. *Horsfieldii*, Clarke, 491
,, *grande*, Bl., 486
,, *grande*, Sm., 488
,, *grande*, Wall., 495
,, heteropleurum, *Bl.*, 486
MEMECYLON, heteropleurum, var. olivacea, *King*, 486
,, *Horsfieldii*, Miq., 491
,, Hullettii, *King*, 484
,, intermedium, *Bl.*, 494
,, Kunstleri, *King*, 484
,, Kurzii, *King*, 485
,, *lampongum*, Miq., 491
,, laevigatum, *Bl.*, 490
,, *laxiflorum*, Wall., 491, 495
,, *lilacinum*, Zoll. et Mor., 489
,, *lucidum*, Presl, 495
,, *lutescens*, Presl, 488
,, Maingayi, *Clarke*, 485
,, *manillanum*, Naud., 488
,, merguica, *King*, 491
,, microstomum, *Clarke*, 487
,, minutiflorum, *Miq.*, 488
,, *Myrilli*, Bl., 490
,, myrsinoides, *Bl.*, 489
,, ,, var. lilacina, *King*, 489
,, oleaefolium, *Bl.*, 490
,, oligoneuron, *Bl.*, 481
,, *ovatum*, Sm., 495
,, pachyderma, Wall., 490
,, pauciflorum, *Bl.*, 491
,, *prasinum*, Naud., 495
,, pubescens, *King*, 482
,, *pyrifolium*, Presl, 495
,, pyrifolium, *Naud.*, 494
,, *subtrinervium*, Miq., var. *grandiflora*, Kurz, 485
,, *tinctorium*, Koen., 494
,, ,, var. β, W. & A., 495
,, *trinerve*, Hassk., 482
,, *umbellatum*, Burm., 494
,, ,, Blume, 494
,, ,, Herb. Heyne, 495
,, ,, Benth., 492
,, *Vosmaerianum*, Scheff., 490
MELALEUCA, Linn., 500
,, *Cajuputi*, Roxb., 501
,, *Cumingiana*, Turcz., 501
,, *decurrens*, Wall., 502
,, *eugeniifolia*, Wall., 502
,, *lancifolia*, Turcz., 501
,, Leucadendron, *Linn.*, 500
,, ,, var. leucadendron, *Duthie*, 501
,, ,, var. minor, *Duthie*, 501
,, *Leucadendron*, Lam., 501
,, *saligna*, Gmel., 501
,, *viridiflora*, Gaertn., 501
Melanium fruticosum, Spreng., 348
MELASTOMACEAE, 409
MELASTOMEAE, 410
MELASTOMA, Linn., 412
,, *adpressum*, Benth., 415
,, *affine*, D. Don, 414
,, *anophanthum*, Naud., 415
,, *articulatum*, Naud., 414

MELASTOMA *Banksii*, Cunn., 414
,, *brachyodon*, Naud., 415
,, *bracteatum*, Wall., 459
,, *bracteatum*, Jack, 460
,, *cernuum*, Wall., 465
,, *crinitum*, Naud., 413
,, decemfidum, *Roxb.*, 412
,, ,, var. mollis, 413
,, *divaricatum*, Willd., 466
,, *erecta*, Jack, 415
,, *exigua*, Jack, 419
,, *eximium*, Bl., 469
,, *fallax*, Wall., 462
,, *Gaudichaudianum*, Naud., 413
,, *glauca*, Griff., 462
,, *glauca*, Jack, 465
,, *gracile*, Jack, 461
,, *heterostegium*, Naud., 414
,, *Hombronianum*, Naud., 415
,, imbricatum, *Wall.*, 413
,, *impuber*, Roxb., 419
,, *laurifolium*, Wall., 470
,, ? *littoreum*, Wall., 423
,, *longifolium*, Naud., 415
,, malabathricum, *Linn.*, 414
,, ,, var. adpressa, *Clarke*, 415
,, ,, ,, normalis, *King*, 415
,, ,, ,, perakensis, *King*, 415
,, ,, ,, polyantha, Benth., 415
,, *malabathricum*, Blanco, 413
,, *malabathricum*, Bl., 413
,, *malabathrica*, Sims, 413
,, *malabathricum*, Desr., 415
,, *microphyllum*, Naud., 415
,, *molle*, Wall., 413
,, *napalense*, Lodd., 415
,, *nemorosum*, Jack, 456
,, *normale*, Don, 415
,, *novae-hollandiae*, Naud., 414
,, *obvolutum*, Jack, 414
,, *obovatum*, var. *oblonga*, Bl., 414
,, *oliganthum*, Naud., 415
,, *oxyphyllum*, Benth., 422
,, *pallida*, Jack, 461
,, *pedicellatum*, Naud., 413
,, *pelagicum*, Naud., 415
,, *petiolare*, Wall., 466
,, *polyanthum*, Benth., 466
,, *polyanthum*, Bl., 415
,, *porphyreum*, Bipp. et Bl., 413
,, *pulverulenta*, Jack, 473
,, *reflexa*, Reinw., 473
,, *rhodoearpum*, Wall., 456
,, *rotundifolia*, Jack, 455
,, *Royenii*, Bl., 415
MELASTOMA *rubicunda*, Jack, 473
,, *rubiginosum*, Wall., 462
,, *sanguineum*, Sims, 413
,, *sechellarum*, Naud., 414
,, *smilacifolia*, Wall., 475
,, *speciosum*, Reinw., 469
,, *tidorense*, Bl., 415
,, *tondanense*, Bl., 415
,, *vacillans*, var. *pallens*, Bl., 462
,, *velutinum*, Seem., 414
,, *Wallichii*, DC., 415
MELOTHRIA, Linn., 381
,, affinis, *King*, 382
,, indica, *Lour.*, 382
,, marginata, *Cogn.*, 383
,, ,, var. heterophylla, 383
,, *Rumphiana*, Scheff., 383
Metrosideros amboinensis, Rumph., 208
Metscherlicia coriacea, Klotsch, 590
MEZONEURON, Desf., 232
,, andamanicum, *Prain*, 234
,, cucullatum, W. & A., 232
,, hymenocarpum, W. & A., 233
,, Kunstleri, *Prain*, 233
,, *pubescens*, Baker, 233
,, sinense, 228
,, sumatranum, *W. & A.*, 235
Micropteryx, Walp., 71
Microtropis coriacea, Wall., 322
MILLETIA, W. & A., 86
,, albiflora, *Prain*, 92
,, atropurpurea, *Benth.*, 89
,, cauliflora, *Prain*, 94
,, coerulea, Baker, 91
,, decipiens, *Prain*, 90
,, eriantha, *Benth.*, 88
,, glaucescens, *Kurz*, 89
,, Hemsleyana, *Prain*, 90
,, macrophylla, *Hook. fil.*, 94
,, Maingayi, *Baker*, 91
,, oocarpa, *Prain*, 92
,, *pachycarpa*, Baker, 107
,, sericea, W. & A., 88
,, ,, var. typica, *Prain*, 88
,, ,, var. malaccensis, *Prain*, 88
,, *thyrsiflora*, Benth., 100
,, unifoliolata, *Prain*, 93
MIMOSEAE, 29, 237
MIMOSA, Linn., 246
,, *biglobosa*, Roxb., 240
,, *Djiringa*, Roxb , 266
,, *dulcis*, Roxb., 263
,, *Farnesiana*, L., 249
,, *heterophylla*, Roxb., 275
,, *Jiringa*, Jack, 266
,, *Koeringa*, Roxb., 266
,, *lucida*, Roxb., 261
,, *marginata*, Lamk., 259
,, *microphylla*, Roxb., 255
,, *natans*, Roxb., 245

MIMOSA *odoratissima*, Linn. fil., 259
,, *pedunculata*, Roxb., 239
,, *procera*, Roxb., 260
,, pudica, *L.*, 247
,, *scandens*, *L.*, 242
,, sepiaria, *Benth.*, 247
,, *Sirissa*, Roxb., 258
,, *Smithiana*, Roxb., 256
,, *speciosa*, Jacq., 258
,, *stipulacea*, Roxb., 256
,, *stipulata*, Roxb., 256
,, *trapezifolia*, Roxb., 274
,, *xylocarpa*, Roxb., 245
Mirbau, 209
Modecca acuminata, Bl., 583
,, *cardiophylla*, Mast., 582
,, *cordifolia*, Kurz, 582
,, *heterophylla*, Kurz, 582
,, *nicobarica*, Kurz, 581
,, *populifolia*, Bl., 583
,, *singaporeana*, Mast., 583
,, *trilobata*, Roxb., 580
MOLLUGO, Linn., 597
,, *Linkii*, Ser., 597
,, pentaphylla, *Linn.*, 597
,, *stricta*, Linn., 597
,, *triphylla*, Lour., 597
Momordica *anthelmintica*, Schum., 381
,, Charantia, *Linn.*, 381
,, Clarkeana, *King*, 379
,, Cochin-chinensis, *Spreng.*, 380
,, *dioica*, Wall., 381
,, *humilis*, Wall., 381
,, *Luffa*, Linn., 378
,, *macropetala*, Mart., 381
,, *muricata*, Willd., 381
,, *Roxburghiana*, Don, 381
,, subangulata, *Bl.*, 380
,, *tubiflora*, Roxb., 376
Monoxora spectabilis, Wight, 504
MUCUNA, Adans, 64
,, acuminata, *Grah.*, 67
,, *anguina*, Scheff., 67
,, *anguina*, Wall., 66
,, *atropurpurea*, Bak., 67
,, biplicata, *Teysm. & Binn.*, 66
,, *corymbosa*, Grah., 68
,, cyanosperma, *K. Schum.*, 65
,, gigantea, *DC.*, 68
,, imbricata, *DC.*, 65
,, monosperma, *DC.*, 66
,, pruriens, *DC.*, 68
,, *prurita*, Hook., 69
,, *utilis*, Wall., 69
Munj, 50
Muricia Cochinchinensis, Lour., 381
MYRIOPHYLLUM, Linn., 310
,, intermedium, *DC.*, 311
,, *indicum*, Wight, 311
,, *lineare*, Heyne MSS., 311
,, *variaefolium*, Hook., 311
Myrobalana Citrina, Gaertn., 333
MYRTACEAE, 496
Myrtus acuminatissima, Bl., 557
,, *amboinensis*, Rumph., 499
,, *canescens*, Lour., 505
,, *caudata*, Wall., 535
,, *Cumini*, Linn., 562
,, *cymosa*, Spreng., 530
,, ? *cymosa*, Bl., 534
,, *densiflora*, Bl., 515
,, *Jambos*, Kunth, 512
,, *Leucoaendron*, Linn., 501
,, *lineata*, Bl., 530
,, *macrophylla*, Spreng., 513
,, *malaccensis*, Spreng., 513
,, *oligoneura*, Korth., 482
,, *quadrangularis*, Ham., 539
,, *samarangensis*, Bl., 511
,, *smilacifolia*, Wall., 504
,, *tomentosa*, Att., 505
,, *trinervia*, Sm., 504
,, *zeylanica*, Linn., 539
Nelitris pallescens, Miq., 506
,, *paniculata*, Lindl., 506
,, *polygama*, Spreng., 506
,, *polymorpha*, Bl., 506
Nellia tandale-cotti, 41
Nematophyxis fruticulosa, Miq., 358
,, *prostrata*, *Miq.*, 358
,, *pusilla*, Miq., 358
NEPTUNIA, Lour., 244
,, oleracea, *Lour.*, 244
Neurocarpum cajanifolium, *Presl.*, 57
,, retusum, *Hassk.*, 57
Neustanthus phaseoloides, Benth., 61
Nicholsonia reptans, Meissn., 135
Nothopanax ? *pinnatum*, Miq., 404
Nuga sylvarum, Rumph., 227
Nugaria, *DC.*, 227
NYSSA, Linn., 607
,, sessiliflora, *Hook. fil.* 607
Obie Songnang, 54
ONAGRACEAE, 355
Orthocharis, Blume, 421
,, *borneensis*, Bl., 422
,, *buruensis*, Teysm. et Binn., 422
,, decumbens, *King*, 423
,, javanica, *Bl.*, 422
,, paniculata, *Korth.*, 421
ORMOCARPUM, Beauv., 127
,, glabrum, *Teysm. & Binn.*, 127
,, sennoides, *DC.*, 127
ORMOSIA, Jacks., 146
,, gracilis, *Prain*, 148
,, macrodisca, *Baker*, 148
,, microsperma, *Baker*, 151
,, ,, var. Ridleyi, 151
,, ,, var. typica, 151
,, nitida, *Prain*, 149
,, parvifolia, *Baker*, 149

Ormosia scandens, *Prain*, 147
,, sumatrana, *Prain*, 150
,, venosa, *Baker*, 152
,, coarctata, ? *Jacks*, 151
,, *coarctata*, Kurz, 151
Osbeckieae, 410
Osbeckia tetrandra, Roxb., 465
Osmelia Maingayi, *King*, 363
Otanthera, *Blume*, 411
,, celebica, *Bl.*, 411
,, nicobarensis, *Teysm. et Binn.*, 412
Outea bijuga, DC., 208
Oxysporeae, 410
Oxyspora, *DC.*, 416
,, acutangula, *King*, 417
,, Curtisii, *King*, 417
,, stellulata, *King*, 417
Pachycentria, Blume, 474
,, tuberculata, *Korth.*, 474
Pachyrhizus, Rich., 53
,, angulatus, *Rich.*, 53
,, *trilobus*, DC., 54
Panax armatum, Wall., 389
,, *fragrans*, Roxb., 405
,, *Jackianum* Wall., 403
,, *pinnatum*, Lam., 404
,, *polycarpum*, Wall., 403
,, *secundum*, Schultz, 404
,, *palmatum*, Roxb., 406
Panga Saran, 192
Panjam, 96
Papilionaceae, 23, 31
Paraderris, 106
Paratropia brachybotrya, Miq., 397
,, *elliptica*, Miq., 397
,, *heterophylla*, Presl, 400
,, *scandens*, Miq., 397
,, *Singalense*, Miq., 395
,, *subulata*, Miq., 396
,, *tomentosa*, Miq., 394
,, *venulosa*, W. & A., 396
Parastemon urophyllum, *DC.*, 285
Parinarum, Juss., 276
,, asperulum, *Miq.*, 281
,, *asperulum*, Hook. fil., 280
,, costatum, *Bl.*, 277
,, glaberrimum, *Hassk.*, 282
,, elatum, *King*, 280
,, Griffithianum, *Benth.*, 283
,, heteropetalum, *Scort.*, 283
,, Kunstleri, *King*, 282
,, Maingayi, *King*, 280
,, ? nitidum, *Hook. fil.*, 284
,, oblongifolium, *Hook. fil.*, 279
,, polyneurum, *Miq.*, 278
,, scabrum, *Hassk.*, 281
,, spicatum, *King*, 279
,, *sumatranum*, Benth., 270
Parkia, R. Br., 238
,, africana, Miq., 240
,, *Brunonis*, Grah., 240
Parkia, *biglobosa*, Benth., 340
,, biglandulosa, *W. & A.*, 238
,, insignis, *Kurz*, 241
,, *intermedia*, Hassk., 240
,, leiophylla, *Kurz*, 241
,, *macrocarpa*, Miq., 241
,, Roxburghii, *G. Don*, 239
,, speciosa, *Hassk.*, 240
Paropsia, Noronh., 577
,, *malayana*, Planch., 577
,, vareciformis, *Mast.*, 577
Passifloraceae, 577
Passiflora, Linn., 578
,, Horsfieldii, *Bl.*, 578
,, edulis, *Sims*, 579
,, foetida, *Linn.*, 579
,, laurifolia, *Linn.*, 579
,, quadrangularis, *Linn.*, 579
,, *singaporeana*, Wall., 584
,, suberosa, *Linn.*, 579
Pauletia, *Cav.*, 178
Pellacalyx, Korth., 320
,, axillaris, *Korth.*, 320
,, Saccardianus, *Scort.*, 321
Peltophorum, Vogel, 223
Peltophorum dasyrachis, *Kurz*, 224
,, ferrugineum, *Benth.*, 224
,, grande, 225
Pemphis acidula, Forst., 348
,, *angustifolia*, Roxb., 348
,, *setosa*, Lour., 348
Pentaptera bialata, Roxb., 332
Peplis indica, Willd., 347
Pestolozzia *laxa*, Thw., 384
,, *pedata*, Zoll. et Mor., 384
Petaloma alternifolia, Roxb., 335
Pete, Rumph., 241
Petrocarpa sumatrana, Benth., 278
Phanera, Lour., 179
,, *albo-lutea*, Miq., 102
,, *bidentata*, Benth., 188
,, *diphylla*, Benth., 178
,, *diptera*, Miq., 193
,, *elongata*, Benth., 181
,, *excelsa*, Bl., 183, 185
,, *ferruginea*, Benth., 185
,, *Finlaysoniana*, Benth., 190
,, *glauca*, Benth., 186
,, *Griffithiana*, Benth., 184
,, *integrifolia*, Benth., 192
,, *lucida*, Benth., 188
,, *purpurea*, Benth., 180
,, *semibifida*, Benth., 182, 185
,, *sumatrana*, Miq., 183, 185
Pharnaceum pentaphyllum, Spreng., 597
,, *strictum*, Spreng., 597
,, *triphyllum*, Spreng , 597
Phaseolus, Linn., 47
,, adenanthus, *G. W. F. Mey*, 48
,, *alatus*, Roxb., 49
,, *amarus*, Roxb., 49
,, calcaratus, *Roxb.*, 49

PHASEOLUS calcaratus, var. gracilis, 50
,, ,, var. typica, 50
,, *decurvus*, Grah., 51
,, *difformis*, Wall., 53
,, *hirtus*, Wall., 50
,, lunatus, *Linn.*, 48
,, *luteus*, Bl., 50
,, Mungo, *Linn.*, 50
,, ,, var. radiatus, *Bak.*, 51
,, obovatus, Grah., 52
,, *pubescens*, Bl., 50
,, *radiatus*, Linn., 51
,, *rostratus*, Wall., 49
,, *senegalensis*, Guill. et Perr., 49
,, *sub-lobatus*, Wall., 50
,, *to·osus*, Roxb., 50
,, trilobus, *Ait.*, 49
,, *trinervius*, Heyne, 50
,, *truxillensis*, H. Bak., 49
,, *vulgaris*, Wall., 48
Phaseolodes sericeum, Kuntze, 88
Phylacium bracteosum, *Benn.*, 129
PHYLLAGATHIS, Blume, 452
,, hispida, *King*, 454
,, Griffithii, *King*, 453
,, rotundifolia, *Bl.*, 454
,, Scortechinni, *King*, 453
,, tuberculata, *King*, 452
Phyllodium pulchellum, Desv., 137
Pierrea dictyoneura, Hance, 368
PITHECOLOBIUM, Mart., 261
,, *acutangulum*, Miq., 275
,, affine, *Baker*, 269
,, angulatum, *Benth.*, 274
,, ,, var. *heterophylla*, 275
,, ,, var. *intermedia*, 275
,, *bigeminum*, Benth., 266
,, ,, var. *bubalina*, 268
,, bubalinum, *Benth.*, 264 268
,, *bubalinum*, Kurz, 267
,, Clypearia, *Benth.*, 273
,, confertum, *Benth.*, 264
,, contortum, *Mart.*, 272, 274
,, dulce, *Benth.*, 263, 252
,, ellipticum, *Hassk.*, 270, 271
,, *fasciculatum*, Benth., 270
,, *Jiringa*, *Prain*, 267
,, *Koeringa*, Kuntze MSS., 266
,, Kunstleri, *Prain*, 271
,, lobatum, *Benth.*, 265, 271
,, *macrophyllum*, Teysm. & Binn., 270
,, macrophyllum, *Spruce*, 271
,, microcarpum, *Benth.*, 268
PITHECOLOBIUM nicobaricum, *Prain*, 267
,, *oppositum*, Kurz, 267, 268
,, *saman*, Benth., 252
,, Teysmanni, *Prain*, 271
PLANCHONIA, Blume, 571
,, andamanica, *King*, 572
,, sundiaca, *Miq.*, 572
Pleurolobium, DC., 145
Podocarpum, *Benth.*, 138
POGONANTHERA, Blume, 473
,, pulverulenta, *Bl.*, 473
,, *reflexa*, Bl., 473
,, *squamulata*, Korth., 473
Poinciana Roxburghii, G. Don, 224
,, *pulcherrima*, Linn., 228
Polydontia arborea, Bl., 292
POLYOSMA, Blume, 299
,, coriacea, *King*, 300
,, fragrans, *Benn.*, 302
,, integrifolia, *Bl.*, 302
,, ,, var. typica, 302
,, ,, var. Wallichii, 303
,, *ilicifolia*, *Bl.*, 300
,, laete-virens, *Griff.*, 303
,, longe-pedicellata, *King*, 305
,, mutabilis, *Bl.*, 301
,, *mutabilis*, Clarke, 303
,, parviflora, *King*, 300
,, Ridleyi, *King*, 304
,, Scortechinii, *King*, 301
,, velutina, *Bl.*, 304
Polystorthia, Bl., 292
Pomeae, 276
Pongam, Adans, 96
PONGAMIA, Vent., 94
,, *amoena*, Wall., 106
,, *atropurpurea*, Wall., 89
,, *coerulea*, Grah., 91
,, *coriacea*, Grah., 101
,, ? *crassifolia*, Grah., 79
,, *dehiscens*, Koord. & Val., 91
,, *dubia*, Grah., 107
,, *elegans*, Grah., 103
,, *elliptica*, Wall., 107
,, *floribunda*, Grah., 103
,, glabra, *Vent.*, 94
,, ,, var. typica, 95
,, ,, var. xerocarpa, 95
,, *grandiflora*, Grah., 98
,, *grandiflora*, Zoll. et Mor., 95
,, *mitis*, Kurz, 95
,, *rosea*, Grah., 78
,, *sericea*, Vent., 88
,, *sinuata*, Wall., 98
,, *uliginosa*, DC., 103, 105
,, *volubilis*, Zoll. et Mor., 107
,, *xerocarpa*, Hassk., 95
Pruneae, 276
PRUNUS, Linn., 285
,, martabanica, *Kurz*, 285
,, ,, var. Scortechinii, *King*, 286

Psammanthe marina, Hance, 597
Pseudarthria capitata, Hassk., 140
,, *polycarpa*, Hassk., 145
Pseudocynometra, 200
PSEUDO-EUGENIA, *Scort.*, 563
,, Perakensis, *Scort.*, 563
,, Singaporensis, *King*, 563
Psilorhegma, 157
Psophocarpus tetragonolobus, DC., 55
PTEROCARPUS, Linn., 123
,, dalbergioides, *Roxb.*, 124
,, *dalbergioides*, Wall., 124
,, *Draco*, Lamk,, 124
,, *floribundus*, Wall., 99
,, indicus, *Willd.*, 123
,, *indicus*, Benth., 125
,, *obtusatus*, Miq., 124
,, *saxatilis*, Bl. MSS., 124
,, *uliginosus*, Roxb., 103
,, *Zollingeri*, Miq., 124
PTERNANDRA, Jack, 475
,, *acuminata*, Dcne, 478
,, *capitata*, Jack, 477
,, cœrulescens, Jack, 476
,, ,, var. capitellata, 477
,, ,, var. Jackiana, 476
,, ,, var. paniculata, 477
,, echinata, Jack, 477
,, ,, var. pubescens, *King*, 477
,, Griffithii, *King*, 477
,, ,, var. cordata, *King*, 478
,, *latifolia*, Triana, 477
,, *paniculata*, Miq., 477
,, *paniculata*, Benth., 477
PTEROLOBIUM, R. Br., 235
,, densiflorum, *Prain*, 236
,, indicum, var. *macroptera*, Bak., 236
,, indicum, var. *microphylla*, Bak., 236
,, *lacerans*, Wall., 231, 236
,, macropterum, *Kurz*, 235
,, *microphyllum*, Kurz, 235
,, punctatum, *Hems.*, 236
Pteroloma triquetrum, Benth., 144
,, *auriculatum*, Miq., 145
PUERARIA, DC., 61
,, phaseoloides, *Benth.*, 61
,, *subspicata*, Benth., 61
Pungamia, Lam., 96
PYGEUM, Gaertn., 286
,, acuminatum, *Colebr.*, 289
,, brevifolium, *Hook. fil.*, 293
,, grandiflorum, *King*, 288
,, Griffithii, *Hook. fil.*, 293
,, Hookerianum, *King*, 293
,, intermedium, *King*, 288
,, Lampongum, *Miq.*, 291
,, lanceolatum, *Hook. fil.*, 289
,, Maingayi, *King*, 288
PYGEUM, ovalifolium, *King*, 292
,, parviflorum, Teysm. & Binn., 291
,, ,, var. densa, *King*, 292
,, persimile, *Kurz*, 291
,, polystachyum, *Hook. fil.*, 290
,, Scortechinii, *King*, 290
,, stipulaceum, *King*, 287
Pyrranthus albus, Wall., 335
,, *littoreus*, Jack, 334
Pyrrotricha tuberosa, W. & A., 44
PYRUS, Linn., 296
,, granulosa, *Bertol*, 297
,, *Karensium*, Kurz, 297
,, *Sikkimensis*, Wenzig, 297
QUISQUALIS densiflora, Wall., 341
,, *ebracteata*, Beauv., 342
,, *glabra*, Burm., 342
,, *indica*, Linn., 342
,, *longiflora*, Presl, 342
,, *Loureiri*, G. Don, 342
,, *pubescens*, Burm., 342
,, *sinensis*, Lindl., 342
,, *villosa*, Roxb., 342
Rain Tree, 253
Rectomitra tuberculata, Bl., 478
Reichardia decapetala, Roth., 229
Rhizophoreae, 311
RHIZOPHORA, Linn., 312
,, *apiculata*, Bl., 313
,, *Candel*, Linn., 318
,, *Candelaria*, W. & A., 313
,, *Candelaria*, DC., 313
,, *caryophylloides*, Jack., 315
,, *caseolaris*, Linn., 355
,, conjugata, *Linn.*, 313
,, *cylindrica*, Roxb., 316
,, *decandra*, Roxb., 317
,, *gymnorhiza*, Linn., 314
,, *latifolia*, Miq., 313
,, *macrorhiza*, Griff., 313
,, *mangle*, Roxb., 313
,, mucronata, *Lamk.*, 312
,, *parviflora*, Roxb., 316
,, *timorensis*, DC., 31
RHODAMNIA, Jack., 504
,, *cineria*, Jack., 504
,, *cinerea*, Griff., 504
,, *concolor*, Miq., 504
,, *Mulleri*, Bl., 505
,, *Nageli*, Miq., 505
,, *spectabilis*, Bl., 504
,, *subtriphylla*, Miq., 505
,, trinervia, *Bl.*, 504
,, ,, var. concolor, 504
,, ,, var. spectabilis, 504
Rhodoleia Teysmanni, *Miq.*, 309
RHODOMYRTUS, D.C., 505
,, tomentosa, *Wight*, 505
Rhynchosia aurea, Ridl., 40
,, *biflora*, DC., 46
,, *crotolaroides*, DC., 43
,, *Grahami*, Wall., 44

Rhynchosia lucida, *DC.*, 70
,, *scarabaeoides*, *DC.*, 46
,, *virgata*, Grah., 44
Robinea candida, Roxb., 85
,, *mitis*, Linn., 95
,, *uliginosa*, Roxb., 102
ROSACEAE, 275
ROUREA, Aubl., 11
,, acuminata, *Hook. fil.*, 12
,, anomala, *King*, 11
,, commutata, *Planch.*, 12
,, concolor, *Blume*, 15
,, *dasyphylla*, Miq., 21
,, fulgens, *Planch.*, 15
,, humilis, *Blume*, 13
,, parallela, *Planch.*, 14
,, ,, var. major, *King*, 14
,, *parvifolia*, *Planch.*, 15
,, pulchella, *Planch.*, 13
,, rugosa, *Planch.*, 14
,, sororia, *Planch.*, 14
ROUREOPSIS, Planch., 15
,, pubinervis, *Planch.*, 16
,, Scortechinii, *King*, 16
Rubeae, 275
RUBUS, Linn., 294
,, *acerifolius*, Wall., 295
,, *alceaefolius*, Poir., 295
,, *asper*, Don, 296
,, *cordifolius*, Don, 295
,, elongatus, *Sm.*, 295
,, *Fairholmianus*, Gardn., 295
,, glomeratus, *Bl.*, 295
,, ,, var. gracilis, *King*, 295
,, *Hamiltonianus*, Wall., 295
,, *Hasskarlii*, Miq., 295
,, *Lobbianus*, Hook., 296
,, *macrocarpus*, Gardn., 295
,, *micropetalus*, Gardn., 295
,, moluccanus, *Linn.*, 294
,, ,, var. alceaefolia, 295
,, *pinnatus*, Willd., 296
,, *reflexus*, Ker, 295
,, rosaefolius, *Sm.*, 296
,, *rugosus*, Sm., 295
Saga, 244
Sagotia triflora, Walp. & Duch., 135
SAMYDACRAE, 358
Sapetir, 205
Sappania, *DC.*, 228
SARACA, Linn., 210
,, *arborescens*, *Burm.*, 214
,, bijuga, *Prain*, 214
,, cauliflora, *Bak.*, 212
,, declinata, *Miq.*, 211
,, indica, *Linn.*, 214
,, Kunstleri, *Prain*, 213
,, latistipulata, *Prain*, 217
,, Lobbiana, *Bak.*, 214
,, macroptera, *Miq.*, 215
,, ,, var. parviflora, *Prain MSS.*, 216
SARACA minor, *Miq.*, 215
,, palembanica, *Miq* , 216
,, thaipingensis, *Cantley* MSS., 211
,, triandra, *Baker*, 216
SAXIFRAGACEAE, 297
Sarau, 192
S'busu, 155
Sciadophyllum avene, 392
,, *ellipticum*, Bl., 397
,, *scandens*, Bl., 397
,, *tomentosum*, Bl., 394
Scorpiurus, *Benth.*, 141
Scotanthus tubiflorus, Naud., 376
,, *Porteanus*, Naud., 377
Selenolobium, 120
Senna, *alata*, Roxb., 162
,, *arborescens*, Roxb., 158
,, *esculenta*, Roxb., 161
,, *occidentalis*, Roxb., 161
,, *tenella*, Roxb., 165
,, *Tora*, Roxb., 159
,, *toroides*, Roxb., 159
,, *sensitiva*, Roxb., 165
,, *Sophera*, Roxb., 161
,, *sumatrana*, Roxb., 164
Sensitive Plant, 247
Sepan, 173
Serianthes grandiflora, *Benth.*, 251
SESBANIA, Pers., 82
,, aculeata, var. *cannabina*, Bak., 83
,, ,, var. *paludosa*, Bak. 83
,, *aegyptiaca*, Kuntze, 83
,, *affinis*, Schrad., 83
,, cannabina, *Pers.*, 83
,, *cannabina*, W. & A., 83
,, *Cochin-chinensis*, Kurz, 83
,, grandiflora, *Pers.*, 84
,, *grandiflora*, Miq., 83
,, *polyphylla*, Miq., 83
,, *punctata*, Benth. MSS., 83
,, paludosa, *Roxb.*, 82
,, *paludosa*, Jacq., 83
SESUVIUM, Linn., 596
,, Portulacastrum, *Linn.*, 596
,, *repens*, Willd., 597
Siboosok, 155
Sibusu, 156
SINDORA, Miq., 201
,, Cochin-chinensis, *Baill.*, 205
,, coriacea, *Prain*, 206
,, Echinocalyx, *Prain*, 204
,, *Galedupa*, Prain, 207
,, intermedia, *Baker*, 204
,, Sumatrana, *Miq.*, 206, 205
,, velutina, *Baker*, 205
,, Wallichiana, *Benth.*, 203
,, *Wallichii*, Benth., 203
,, ,, var. *intermedia*, Bak., 205
,, ,, var. *ovalifolia*, Maing., 204

Siris black, 259
,, *white*, 256
Sissoa, 114
Smithia, Ait., 126
,, *abyssinica*, Hochst., 127
,, *aspera*, Roxb., 128
,, sensitiva, *Ait.*, 126
,, javanica, *Miq.*, 127
Sola, 83
SONNERATIA, Linn. fil., 354
,, acida, *Linn. fil.*, 354
,, ,, var. Griffithii, 355
,, *acida*, Benth., 355
,, *alba*, Griff., 355
,, alba, *Smith*, 355
,, *Griffithii*, Kurz, 355
,, *Mossambicensis*, Klotsch, 355
,, *neglecta*, Bl., 355
,, *evenia*, Bl., 355
,, *lanceolata*, Bl., 355
,, *obovata*, Bl., 355
,, *ovalis*, Korth, 355
,, *Pagapat*, Blanco, 355
SONERILEAE, 410
SONERILA, Roxb., 426
,, albiflora, *Stapf & King*, 436
,, andamensis, *Stapf & King*, 434
,, begoniaefolia, *Bl.*, 449
,, bicolor, *Stapf & King*, 451
,, brachyantha, *Stapf & King*, 445
,, bracteata, *Stapf & King*, 443
,, calaminthifolia, *Stapf & King*, 431
,, Calycula, *Stapf and King*, 451
,, caesia, *Stapf and King*, 444
,, capitata, *Stapf and King*, 443
,, congesta, *Stapf and King*, 440
,, costulata, *Stapf and King*, 447
,, Cyclaminella, *Stapf and King*, 441
,, ,, var. canescens, *Stapf and King*, 441
,, elatostemoides, *Stapf and King*, 450
,, elliptica, *Stapf and King*, 438
,, epilobioides, *Stapf and King*, 430
,, erecta, *Jack*, 431
,, ,, var. discolor, *Stapf and King*, 432
,, ,, var. flexuosa, *Stapf and King*, 432
,, flaccida, *Stapf and King*, 433
,, glabriflora, *Stapf and King*, 450
,, Griffithii, *C. B. Clarke*, 440
,, heterostemona, *Naud.*, 441
,, hyssopifolia, *Stapf and King*, 431
,, integrifolia, *Stapf*, 442
,, ,, var. acuminatissima, *Stapf and King*, 443
SONERILA lasiantha, *Stapf and King*, 437
,, macrophylla, *Stapf and King*, 447
,, ,, var. laxipilosa, *Stapf and King*, 448
,, microcarpa, *Stapf and King*, 446
,, mollis, *Stapf and King*, 436
,, *moluccana*, Jack, 448
,, *moluccana*, Benn, 449
,, muscicola, *Stapf and King*, 439
,, Nidularia, *Stapf and King*, 445
,, *obliqua*, Cogn., 442
,, pallida, *Stapf and King*, 435
,, paradoxa, *Naud.*, 448
,, populifolia, *Stapf and King*, 434
,, repens, *Stapf and King*, 438
,, rudis, *Stapf and King*, 435
,, saxosa, *Stapf and King*, 439
,, suffruticosa, *Stapf and King*, 437
,, succulenta, *Stapf and King*, 438
,, tenuifolia, *Blume*, 432
,, ,, var. hirsuta, *Stapf and King*, 433
Sophora *glabra*, Hassk., 146
,, tomentosa, *Linn.*, 146
SPATHOLOBUS, Hassk., 74
,, acuminatus, *Benth.*, 77
,, bracteolatus, *Prain*, 76
,, crassifolius, *Benth.*, 78
,, dubius, *Prain*, 78
,, ferrugineus, *Benth.*, 75
,, gyrocarpus, *Benth.*, 76, 77
,, littoralis, *Hassk.*, 78
,, macropterus, *Miq.*, 79
,, Maingayi, *Prain*, 79
,, riparius, *Prain*, 78
,, Roxburghii, *Benth.*, 75
,, Ridleyi, *Prain*, 80
Spiraea pinnata, Bl., 299
Stenotropis, 70
Stizolobium imbricatum, Kuntze, 65
,, *Junghuhnianum*, Kuntze, 65
,, *giganteum*, Kuntze, 68
,, *pruriens*, Pers., 69
Stravidium acuminatum, Wall., 568
,, *acutangulum*, Miers, 570
,, *album*, DC., 567
,, *coccineum*, DC., 571
,, *demissum*, Miers, 571
,, *globosum*, Miers, 571
,, *Horsfieldii*, Miers, 571
,, *obtusangulum*, Bl., 570
,, *pubescens*, Miers, 571
,, *reticulatum*, Miers, 571
,, *Rheedii*, Bl., 570
,, *rubrum*, DC., 570
,, *sarcostachys*, Bl., 568
,, *serratum*, Miers, 571
,, *spicatum*, DC., 571

Stravidium spicatum, Miers, 571
Strongylodon ruber, *Vogel*, 69
Strophostyles, 49
Strychnos ? *grandis*, Wall., 324
Syzygium altissimum, Wall., 557
,, *angkolanum*, Miq., 560
,, *capillare*, Wall., 535
,, *caryophyllifolium*, DC., 562
,, *caudatum*, Wall., 530
,, *cinereum*, Wall., 554
,, *claviflorum*, Wall., 537
,, *concinum*, Wall., 530
,, *corticatum*, Wall., 539
,, *costatum*, Wall., 539, 560
,, *cymosum*, DC., 530
,, *euneuron*, Miq., 543
,, *excavatum*, Wall., 537, 538
,, *expansum*, Wall., 543
,, *filiforme*, Wall., 535
,, *firmum*, Thw., 522
,, *grande*, Walp., 522
,, *gratum*, Wall., 539
,, *Inophyllum*, Wall., 544
,, *Jambolanum*, DC., 561
,, ,, var. *microcarpum*, Thw., 562
,, *lateriflorum*, Royle, 562
,, *longiflorum*, Wall., 537
,, *montanum*, DC., 522
,, *myrtifolium*, DC., 549
,, *nelitricarpum*, T. & B., 530
,, *nervosum*, DC., 560
,, *nodosum*, Miq., 560
,, *oblatum*, Wall., 545
,, *obovatum*, Wall., 560
,, *Paniala*, Wall., 560
,, *politum*, Wall., 540
,, *polyanthum*, Thw., 560
,, *pulchellum*, Wall., 545
,, *punctulatum*, Wall., 552
,, *pyrifolium*, Wall., 529
,, *ribesoides*, Wall., 554, 560
,, *rigidum*, Wall., 548
,, *scabridum*, Wall., 539
,, *scoparium*, Wall., 555
,, *suavissimum*, Wall., 538
,, *sub-decussatum*, Wall., 551
,, *subtile*, Miq., 554
,, *truncatum*, Miq., 545
,, *vastum*, Wall., 560
,, *verecundum*, Wall., 556
,, *vimineum*, Wall., 506, 530
,, *Zeylanicum*, DC., 539
TAMARINDUS, Linn., 49
,, indica, *Linn.*, 201
,, *occidentalis*, Gaertn., 201
,, *officinalis*, Hook., 201
,, *umbrosa*, Salisb., 201
Tandale-cotti, 38
Taeniochlaena Griffithii, *Hook. fil.*, 20
Talan, 211, 217
Talan-Kognet, 212, 213
Tapan, 167
TEPHROSIA, Pers., 84
,, *amoena*, Eckl., 86
,, *amoena*, Pers., 86
,, *amoena*, Wall., 86
,, candida, *DC.*, 84
,, *colutea*, Wight, 86
,, Hookeriana, *W. & A.*, 85
,, ,, var. amoena, *Prain*, 85
,, *hirta*, Ham., 86
,, purpurea, Pers., 85
,, subamoena, *Prain*, 86
,, villosa, Pers., 86
Teramnus, Sw., 58
,, labialis, *Spreng.*, 58
,, var. mollis, *Baker*, 59
TERMINALIA, Linn., 327
,, *Badamia*, Tu'lne, 331
,, belerica, *Roxb.*, 329
,, bialata, *Steud.*, 332
,, Catappa, *Linn.*, 331
,, Citrina, *Roxb.*, 329
,, citrina, *Flem.*, 328
,, ,, var. Malayana, 329
,, *eglandulosa*, Roxb., 330
,, foetidissima, *Griff.*, 331
,, *Gella*, Dalz., 330
,, *intermedia*, Spreng., 331
,, *lancifolia*, Griff., 336
,, Manii, *King*, 329
,, *moluccana*, Roxb., 330
,, *moluccana*, Lam., 331
,, *Myrobalana*, Roth, 331
,, nitens, *Presl*, 330
,, phellocarpa, *King*, 330
,, *procera*, Roxb., 331
,, *punctata*, Roth., 330
,, *subcordata*, Willd., 331
,, subspathulata, *King*, 332
TETRAMELES, R. Br., 574
,, nudiflora, R. Br., 575
,, *Grahamiana*, Wight, 575
,, *rufinervis*, Miq., 575
Thin-win, 96
Tjering, 266
Touchiroa bantamensis, Hassk., 223
,, *caudata*, Prain MSS., 219
,, *Curtisii*, Prain MSS., 220
,, *glauca*, Prain MSS., 221
,, *gracilis*, Prain MSS., 223
,, *Scortechinii*, Prain MSS., 220
,, *speciosa*, Prain MSS., 222
,, *Wallichii*, Prain MSS., 221
,, *Wrayi*, Prain MSS., 222
Trembleya rhinanthera, Griff., 414
TREVESIA, Vis., 401
,, palmata, *Vis.*, 401
,, ,, var. cheirantha, *Clarke*, 402
Trichodia vareciformis, Griff., 578
Tricholobus ferrugineus, Blume, 4
TRICHOSANTHES, Linn., 370

TRICHOSANTHES *anguina*, Wall., 373
,, *aspera*, Heyne, 373
,, *bracteata*, Kurz, 373
,, celebica, *Cogn.*, 374
,, *cordata*, Wall., 373
,, *costata*, Bl., 376
,, cucumerina, *Linn.*, 371, 376
,, *grandibracteata*, Kurz, 374
,, *grandiflora*, Wall., 370
,, Hearni, *F. Mull.*, 372
,, *heterpetosperma*, *Kurz*, 372
,, *heteroclita*, Roxb., 370
,, *hexasperma*, Bl., 370
,, *integrifolia*, Kurz, 376
,, *laciniosa*, Wall., 373
,, *laciniosa*, Klein MSS., 371
,, *macrocarpa*, Roxb., 370
,, *multiloba*, Clarke, 374
,, *officinalis*, Wall., 376
,, palmata, *Roxb.*, 373
,, *pilosa*, Wall., 371
,, *pubera*, Bl., 373
,, reniformis, *Miq.*, 372
,, *tricuspis*, Miq., 373
,, tricuspidata, *Lour.*, 372
,, Wallichiana, *Wight*, 373
,, Wawraei, *Cogn.*, 374
Tripodanthera Cochin-chinensis, Roem., 376
TRISTANIA, R. Br., 501
,, *burmannica*, Griff., 504
,, Maingayi, *Duthie*, 502
,, merguensis, *Griff.*, 502
,, obovata, *R. Br.*, 503
,, subauriculata, *King*, 502
,, *sumatrana*, Miq., 503
,, Whiteana, *Griff.*, 503
,, *Wightiana*, Duthie, 503
Troostwyckia singularis, Miq., 17
Tualang, 167
Tubicalyx, 235
Tupidanthus calyptratus, *Hook. fil. et Thoms.*, 407
UMBELLIFERAE, 597
Unjiha, 257
URARIA, Desv., 129
,, *comosa*, DC., 131
URARIA crinita, *Desv.*, 130
,, lagopoides, *DC.*, 131
,, *linearis*, Hassk., 130
,, picta, *Desv.*, 130
,, *picta*, Wight, 131
,, *retusa*, Wall., 131
Urd, 50
Vachelia Farnesiana, W. & A., 249
VICIEAE, 23
VIGNA, Savi
,, *anomala*, Walp., 52
,, Catjang, *Walp.*, 52
,, ,, var. sinensis, 52
,, ,, var. typica, 52
,, *lutea*, A. Gray, 52
,, pilosa, *Bak.*, 53
,, retusa, Walp., 51
,, *sinensis*, Endl., 52
Vitis atroviridis, Wall., 384
,, *trichophora*, Wall., 384
WARDENIA, King
,, simplex, *King*, 404
White Siris, 256
Weinnmannia Blumei, *Planch.*, 299
Xiphocarpus candidus, Hassk., 85
Xylia dolabriformis, *Benth.*, 245
ZANONIA, Linn., 385
,, *cissoides*, Wall., 384
,, Clarkei, *King*, 385
,, indica, *Linn.*, 385
,, *laxa*, Wall., 384
,, *pedata*, Miq., 384
,, *sarcophylla*, *Wall.*, 386
ZOOPHTHALMUM, 65
,, *acuminatum*, Prain MSS., 67
,, *biplicatum*, Prain MSS., 67
,, *giganteum*, Prain MSS., 68
,, *monospermum*, Prain MSS., 66
,, *nigrescens*, Prain MSS., 65
ZORNIA, Gmel., 125
,, *angustifolia*, Smith, 126
,, *dictyocarpa*, DC., 126
,, diphylla, *Pers.*, 126
,, *gibbosa*, Span. 126
,, *graminea*, Span., 126
,, *pulchella*, Pers., 137
,, *strobilifera*, Pers., 43

New York Botanical Garden Library
QK 354.7 .K55 no.9 -13
King, George/Materials for a flora of th
gen
3 5185 00060 1615